Bellevue Transit Master Plan

DATE: May 8, 2014

TO: Members of the Transportation Commission

CC: Members of the Planning Commission
Members of the Human Services Commission
Members of the Parks and Community Services Board
Members of the Arts Commission

FROM: Franz Loewenherz, Senior Transportation Planner
floewenherz@bellevuewa.gov 425-452-4077

SUBJECT: Bellevue Transit Master Plan:
Draft Transit Capital Vision Report & Draft Transit Master Plan

INTRODUCTION

The Transit Master Plan (TMP) is a comprehensive look ahead to the type of system that will be required to meet Bellevue's transit needs through 2030. The TMP is being overseen by the City's Transportation Commission whose work is guided by Council approved project principles and input from members of the Planning, Arts, and Human Services Commissions and the Parks and Community Services Board.

On May 8, 2014 staff will provide Transportation Commission members a status report on the Transit Master Plan. Staff will invite Commissioners to review and discuss the following three topics:

1. **Draft Transit Capital Vision Report –** On April 14, 2014 Transportation Commissioners and staff received Council feedback and general consensus on the Draft Capital Vision Report. Council recognizes that "encouraging long-term ridership growth" (Project Principles) in Bellevue necessitates both transit service enhancements paired with the City's commitment to a supportive land use environment, pedestrian and bicycle amenities, and transit speed and reliability infrastructure. At tonight's meeting staff seeks Transportation Commission approval of the Draft Transit Capital Vision Report. The following are the notable differences between the March 26th and the current version of the Draft Report (see enclosed document):

   - New content in the Executive Summary, including two new pages summarizing Community Input (6-7), completed summaries for the Development Lot (10-11), Ped-Bike Environment (12-13), Transit Stop (14-17), and a more succinct description of the Project Prioritization (22-23).
   - New content in the Development Lot section, including:
     - the new "5 Ds of the Built Environment" graphic and supporting text;
     - Comprehensive Plan policies excerpts (32);
     - Eastgate/I-90 vision map for future development (33).
   - In the Ped-Bike Environment section, new narrative is provided for the sidewalk, bike/offstreet path, and trail project pages (42-47), the three associated maps have been updated to include color-coded prioritization, and one new page describes the difference between Euclidean and network-based analysis.
   - In the Transit Stop section:
     - Figure 58 on page 61 (then Figure 42) was revised to reflect boardings (ons) only, and Figure 59 (then Figure 46) was updated accordingly to reflect stops warranting shelters;

    - Figure 81 was added, a chart that compares existing layover to future needs by MMA (see attached);
    - Figures 82 and 83 (then Fig. 65 and 66) were corrected to reflect the actual estimated layover needs by MMA.
- In the Transit Running Way section:
    - Maps and narrative were migrated into this section (148-153), which were included only in the Executive Summary in the earlier version;
    - Two example projects are now provided to illustrate the prioritization process (page 153);
    - Figure 135 on page 152 provides a flow-chart of the transportation planning process.
    - The existing prioritization process has been re-classed as the 'long-term project prioritization.'
    - Two Low Priority projects were removed from the existing prioritization process, reducing the total prioritized projects from 60 to 58. The projects removed were Citywide-S1 and Citywide-S2. They were eliminated because they were the only two citywide (i.e. non-location specific) projects included. Other citywide projects were deliberately not included in the first place; the inclusion of these two in the totals was an oversight, as neither is reflected in the priority–cost matrix in Appendix D10.
    - A separate project ranking system was developed called the 'short-term supplemental project prioritization.' Pages 154-155 were added to the Transit Running Way section to describe this additional ranking system, its purpose, and an example of a project that benefits from its use (L23/L24).
- In the Appendices:
    - Appendix A now lists all Comprehensive Plan policies relating to transit capital issues;
    - The tables in Appendix B1 now include the projects from the Eastgate/I-90 Plan;
    - Appendix B2 was added, which provides the project maps from the two source documents (2009 Ped-Bike Plan and Eastgate/I-90 Plan);
    - Appendix C1 was added, which lists all stops warranting shelters and provides a map of those stops color-coded to reflect intensity of boarding activity;
    - Appendix C2, which was previously incomplete, now includes all tables, maps, and additional narrative related to the Commuter Parking analysis;
    - Appendix C3 was added, which reproduces Bellevue City Code 20.20.200, the requirements to establish a lease lot;
    - Appendix C4 was added, which provides the full bus layover needs by route terminal data, previously included in the body of the document;
    - Appendix C5 – Existing Bus Layover has been added, per table provided email from Metro.
    - The Bellevue College Connection pamphlet was added as Appendix D6, adjusting the numbering of the existing appendices that follow;
    - Appendix D10 now includes two tables instead of one, the new one being a matrix of the short-term supplemental project prioritization by cost (the existing table was for long-term prioritization);
    - The title of Appendix Table 35 (then AT 29) was revised to indicate that only FTN-served intersections are included.

2. **Draft LUCA: Commuter Parking Facility –** While the City does not build or maintain its own parking facilities for transit users, it can help to facilitate partnerships with other local organizations that have a surplus of underutilized parking to permit use of those facilities for park-and-ride purposes. Based on feedback received at the April 14, 2014 City Council meeting, it appears Councilmembers regard leased lot commuter parking arrangements between King County Metro and faith communities as a method to improve access to the Frequent Transit Network and mitigate deficits in the availability of commuter parking stalls in Bellevue. Other cities along the I-90 and I-405 corridors regard lease lots as an allowable use, while the City of Bellevue requires applicants to secure an Administrative Conditional Use permit as required by the Land Use Code (see following).

20.20.200 Commuter parking facility.

A. The applicant may propose a commuter parking facility providing no more than 50 parking spaces and utilizing the parking area of an existing use through the administrative conditional use process, Part 20.30E LUC. Appeals of decisions made pursuant to this subsection will be decided using the Process II appeal procedures, LUC 20.35.250.

B. The Director of the Development Services Department may approve a commuter parking facility described in subsection A of this section only if he/she finds that:

1. The commuter parking facility is proposed as part of a transportation program.
2. The number of parking spaces proposed for the commuter parking facility is in excess of the actual parking demand for the primary use during overlapping hours of operation.
3. The subject property abuts and gains access from a major, secondary or collector arterial as defined by the Transportation Department.
4. Signage proposed in conjunction with the commuter parking facility is adequate to identify the facility and in keeping with the general character of the immediate vicinity.
5. The location of the commuter parking facility on the subject property will have no significant adverse impact on uses in the immediate vicinity.

C. The Director of the Development Services Department may impose a time limit upon the validity of the administrative Conditional Use Permit granted pursuant to this section in order to ensure periodic review of the commuter parking facility. (Ord. 5480, 10-20-03, § 7; Ord. 4978, 3-17-97, § 1; Ord. 3530, 8-12-85, § 17; Ord. 3498, 5-27-85, §§ 10, 11)

On May 8, 2014, staff will present the Transportation Commission with the following suggested language to advance Planning Commission review of this topic as part of a future Land Use Code Amendment (LUCA) process:

Recommend that Council direct staff and the Planning Commission to evaluate whether commuter parking leased lot arrangements should be allowed outright as a permitted use within one-quarter mile radius to Bellevue's Frequent Transit Network, rather than through an Administrative Conditional Use Permit as currently required by LUC 20.20.200.

This draft language – if deemed appropriate – would be incorporated in the Transportation Commission's July 7, 2014 transmittal letter to Council requesting adoption of the Transit Master Plan. If included in the Transportation Commission's transmittal letter, the City Council will need to determine the priority of this topic relative to other Planning Commission LUCA assignments.

3. **Draft Transit Master Plan –** On May 8, 2014, staff will present the Transportation Commission with a Draft Transit Master Plan that merges the three major service, capital, and policy elements of this project. This will be another opportunity for feedback prior to Plan adoption. After a public hearing (SEPA requirement) held before the Transportation Commission on June 12, 2014, staff will return to the City Council on July 7, 2014 seeking formal Council adoption of the Bellevue Transit Master Plan. Upon acceptance, the TMP will inform the region's transit service providers of Bellevue's priorities.

Attachment 1: Draft Transit Capital Vision Report
Attachment 2: Draft Transit Master Plan

BELLEVUE COLLEGE

3000 Landerholm Circle SE • Bellevue, WA 98007-6484 • www.bellevuecollege.edu

April 16, 2014

Bellevue City Council
450 110th Ave. NE
P.O. Box 90012
Bellevue WA 98004

Dear Mayor Claudia Balducci and Honorable Councilmembers,

Bellevue College has been pleased to participate in the City of Bellevue Eastgate/I-90 Land Use and Transportation Project and the Transit Master Plan. Over the course of these two projects, we have participated at forums, field investigations, commission meetings, and met directly with City staff and consultants. From these two planning initiatives, the Bellevue College Connection project has emerged as a significant opportunity to improve vehicle, transit, bicycle, and pedestrian movement. This project will benefit campus, the surrounding corridors and neighborhoods, the Eastgate Transit Center, and the potential transit-oriented development site.

The College is greatly interested in the opportunity to enhance pedestrian safety and walkability, create a bicycle connection to the Mountains to Sound Greenway, and facilitate frequent local and regional transit with fewer areas of conflict. This project will support and expand our recent growth in transit commuting, which nearly one in three students cite as their primary mode of transportation. It will also support low impact choices like walking and biking. The benefits of reduced auto congestion combined with new trail and transit connections will support both the College and the surrounding community.

Bellevue College will be an active partner in advancing the Connection project. We anticipate collaborating with the City and relevant partners such as Sound Transit, King County Metro, the Washington State Department of Transportation, and the Mountains to Sound Greenway to realize the full potential of the Connection project. While state funding allocations have become constrained and remain competitive between colleges and other state agencies, we anticipate opportunities to provide limited matching funds. We understand the preliminary design/engineering phase of the concept specifically may be an important phase for contributions from local partners.

We appreciate the initiative the City of Bellevue has shown in undertaking these planning processes and improving transportation and land-use in the Eastgate I-90 area. We look forward to collaborating in the realization of the vision outlined in these projects and specifically the Bellevue College Connection.

Best Regards,

Ray White
VP of Administrative Services
Bellevue College

TRANSIT CAPITAL VISION REPORT

Bellevue Transit Master Plan

CITY OF BELLEVUE

April 2014

Transportation Department

Draft

April 22, 2013

prepared for the
May 8, 2014 meeting of the
Transportation Commission

Draft

PHOTO BY WSDOT

Title VI Notice to Public

It is the City of Bellevue's policy to assure that no person shall, on the grounds of race, color, national origin or sex, as provided by Title VI of the Civil Rights Act of 1964, be excluded from participation in, be denied the benefits of, or be otherwise discriminated against under any of its federally funded programs and activities. Any person who believes his/her Title VI protection has been violated may file a complaint with the Title VI Coordinator. For Title VI complaint forms and advice, please contact the Title VI Coordinator at 425-452-4496.

CONTENTS

Draft

EXECUTIVE SUMMARY 1

Introduction 1
The Development Lot 10
The Pedestrian and Bicycle Environment 12
The Transit Stop 14
The Transit Running Way 18

THE DEVELOPMENT LOT 25

Coordinating Transit and Land Use 26

THE PEDESTRIAN AND BICYCLE ENVIRONMENT 35

Background. 36
Pedestrian and Bicycle Access Improvement Projects 42
2030 Access Analysis 54

THE TRANSIT STOP 57

Background. 58
Bus Stop Amenities. 60
Commuter Parking 66
Background. 66
Context 68
Park-and-Ride Use 71
2030 Park-and-ride use. 74
Recommendations 77
Regional Efforts Underway. 82
Conclusions. 83
Bus Layover. 84
Methodology 86
Space Requirements 88
Location Implications 92

TRANSIT RUNNING WAY. 97

Background. 98
Past Studies 102
Transit Priority Toolbox 107
Intersection Treatments 109
Bus Stop Treatments 113
Running Way Treatments 116
Issue Identification 122
Data Sources. 123
Data Processing 135
Data Analysis. 138
Results 140
Potential Improvements 145
Estimated Project Costs 148
Project Prioritization 150
Transit Running Way Improvements 156
Spot Improvements 163
Transit Signal Priority 169
Tracking & Further Study 173
Projected Outcomes 175

APPENDICES. A181

Appendix A A183
Appendix A: Comprehensive Plan Policies Related to Transit. A183
Appendix B A187
Appendix B1: Transit Priority Pedestrian and Bicycle Project Lists A187
Appendix B2: Source Document Project Maps A201
Appendix C A205
Appendix C1: Bus Shelter Warrants. A205
Appendix C2: Commuter Parking Analysis Data. . . . A208
Appendix C3: Requirements to Establish a Commuter Parking Facility A214
Appendix C4: Bus Layover Needs A215
Appendix C5: Existing Bus Layover A216
Appendix D A217
Appendix D1: Issue Identification Measure Maps . . . A217
Appendix D2: Data Sources Considered But Not Used. A227
Appendix D3: Corridor Throughput Analysis A230
Appendix D4: Bellevue Way SE Traffic Analysis Summary A251
Appendix D5: Downtown Bellevue Micro-Simulation Analysis A252
Appendix D6: Brouchure for the Bellevue College Connection – 142nd pl SE / Snoqualmie River Rd Multimodal Transportation Corridor A263
Appendix D7: Bellevue College Connection Segment Analysis A275
Appendix D8: Projects No Longer Under Consideration A298
Appendix D9: Potential Long-Term TSP Locations. . A302
Appendix D10: Transit Project Priority–Cost Matrices A305
Appendix D11: Value of Travel Time Savings A307
Appendix D12: 2030 Citywide Level of Service (LOS) A311

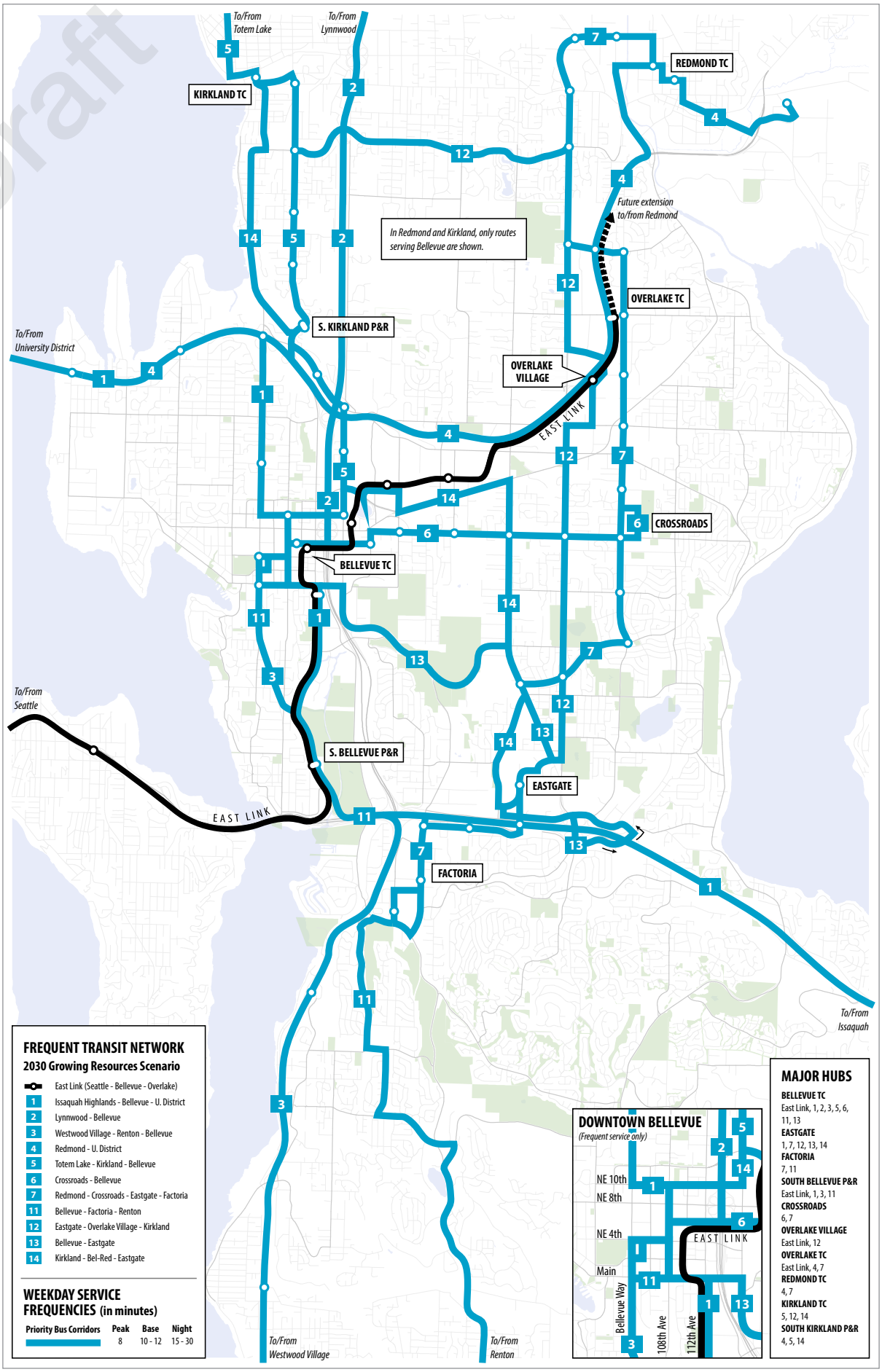


Figure 1 2030 Frequent Transit Network (FTN).

Draft

EXECUTIVE SUMMARY

INTRODUCTION

The Bellevue Transit Master Plan (TMP) will establish short- and long-term policies and projects that help foster a high-quality transit system that is more effective at connecting residents, employees, and visitors in Bellevue with the places they want to go. The *Transit Service Vision Report*, published in October 2013, identified where and how frequently service will operate according to three funding scenarios (Growing, Stable, and Reduced) at three time horizons (2015, 2022, and 2030). This *Transit Capital Vision Report* considers the various types of infrastructure that support productive, accessible, efficient transit services in Bellevue. The report proposes more than 100 projects that would improve transit speed and reliability and identifies investments in the pedestrian and bicycle access network, bus stops, and park-and-ride facilities, all with a focus on helping the City realize its proposed 2030 Frequent Transit Network (FTN).

Draft

Purpose

The Transit Capital Vision is the result of an approximately six month-long process undertaken by the Transportation Department following completion of the Transit Service Vision. The Capital Vision seeks to address the variety of means through which the City can positively affect the operation and user experience of transit within Bellevue. While the City of Bellevue does not operate its own bus system, it plays a critical role in ensuring that high quality transit is available to keep Bellevue moving. Specifically, the City's authority is to:

- Manage street rights-of-way on which transit operates. By investing in state-of-the-art adaptive traffic signal systems with transit signal priority, Bellevue reduces transit vehicle delay, travel time, and the number of stops on city streets.
- Develop and manage sidewalks and bicycle facilities. By creating accessible communities that seamlessly integrate the pedestrian, bicycle, and transit networks, Bellevue increases the market demand for public transportation.
- Set land use policies. By creating vibrant concentrations of retail, office, service, residential, and recreational activity, Bellevue ensures that the greatest possible number of residents and employees have access to high quality transit.
- Use transit as a tool to support the Bellevue Comprehensive Plan. By adopting transit supportive policies, Bellevue has clarified its commitment to public transportation as part of a balanced strategy to improve mobility and meet sustainability and economic development goals.
- Advocate for Bellevue residents and businesses in regional forums. By working with residents and businesses to identify the City's transit needs, Bellevue has been successful in identifying and attracting new transit investments.

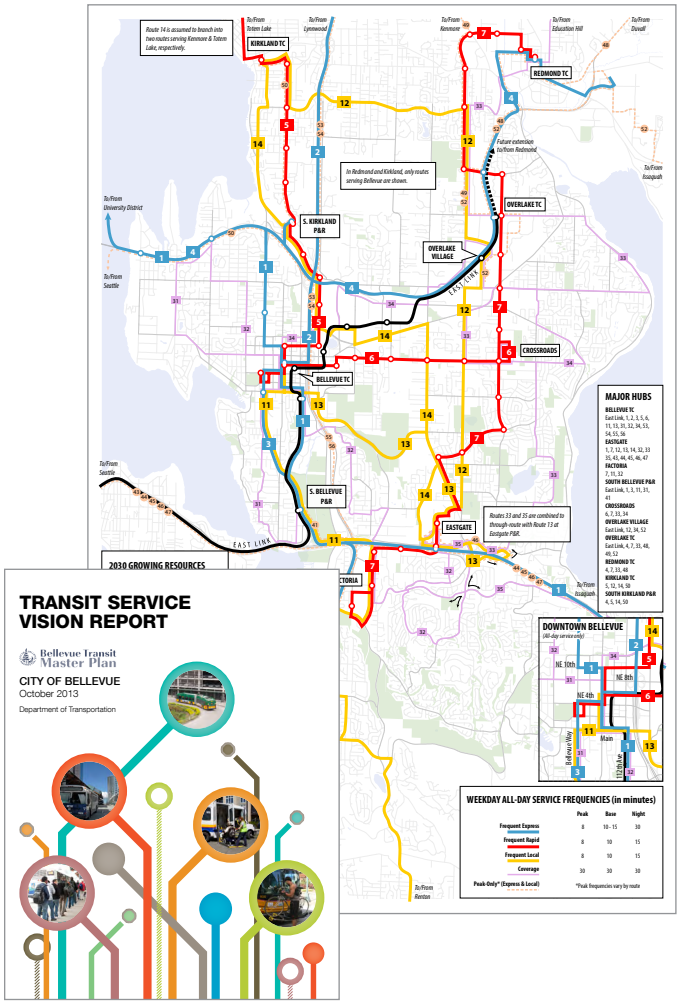


Figure 2 The *Transit Service Vision Report* presents route-level recommendations for transit in Bellevue that are responsive to three financial scenarios and attune to three time horizons. The 2030 Growing Resources Network (pictured above) is the most optimistic of the networks presented.

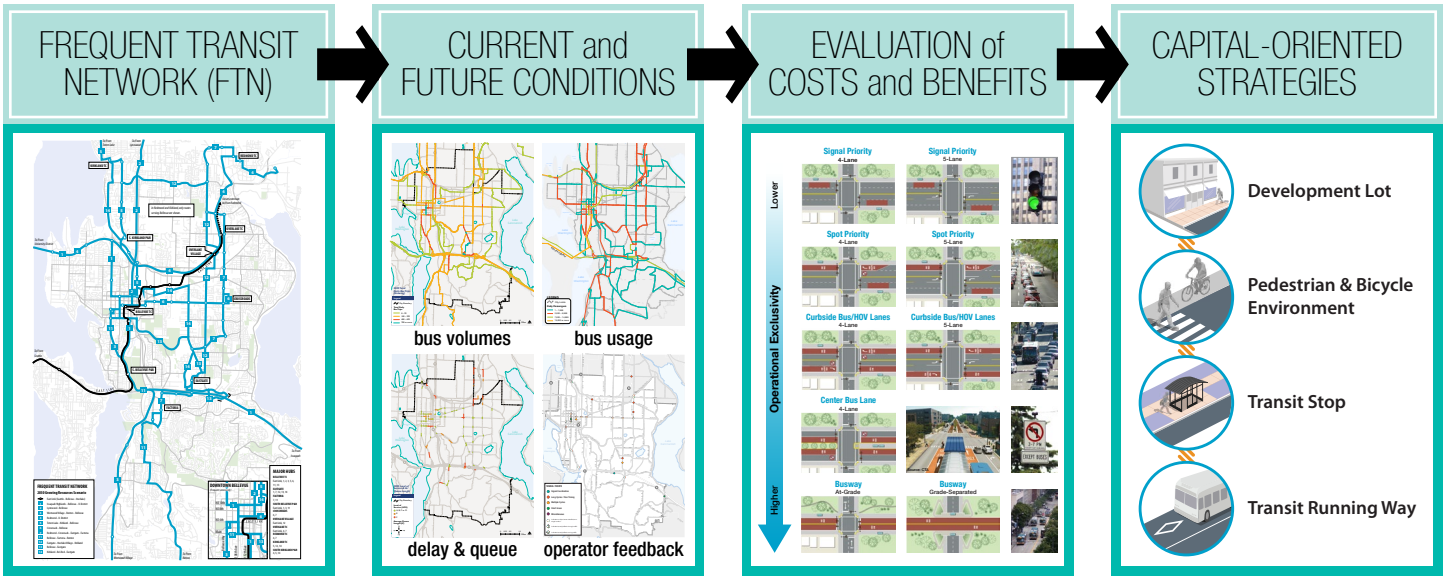
Policy Background

The Bellevue City Council approved the Transit Master Plan Project Principles on July 9, 2012, which represent the Council's priorities for directing development of the Transit Master Plan (see Figure 5 on page 5). The City Council envisions a fully integrated and user-friendly network of transit services for Bellevue that supports the city's growth, economic vitality, and livability.

Bellevue's Comprehensive Plan also acknowledges that responding to anticipated growth in travel necessitates a multi-modal transportation solution that offers the public real choices about how they travel within, to, and through Bellevue. Comprehensive Plan Policy TR-50 directs the Transportation Department to "work with transit providers to implement the Bellevue Transit Plan as an attractive travel option for local residents, employees, students, visitors, businesses and other users of regional facilities." This policy, along with others in the City's Comprehensive Plan, highlights Bellevue's recognition that enabling people to substitute single occupancy vehicle trips for transit

Draft

Figure 3 The Transit Master Plan process arrives at capital-oriented strategies based on a detailed review of where bus service is needed to support Bellevue's growing population and an appraisal of what investments can influence the public's decision to use transit.



Where is bus service expected to be convenient, reliable, easy-to-use?

What are the current and future conditions on FTN corridors?

What are the costs and benefits of different levels of operational exclusivity?

What strategies can influence the public's decision to use transit?

Draft

trips has the potential to convey multiple public benefits such as: increased transportation options; reduced growth of traffic congestion; decreased air, water, and noise pollution; support for climate change emission reduction goals; and stimulation of the local economy.

Encouraging long-term ridership growth involves building capacity to meet future demand for transit service by: (i) providing service where high ridership is anticipated, typically where there is some mix of higher residential or commercial density, major activity centers, and measures that discourage driving, such as limited parking; (ii) building and supporting park-and-ride facilities that help people access the transit system; (iii) improving the way people make transit connections so they can reach more destinations in less time; (iv) investing in speed and reliability enhancements such as transit priority measures and bus rapid transit (BRT).

Consistent with guidance from City Council, the Transportation Commission, existing policies, and the framework established by the TMP Service Element, the Capital Element has adopted four Capital-Oriented Strategies that will help to achieve the “Abundant Access” vision (see Figure 4).

Figure 4 Four capital-oriented strategies have been defined to help realize the "Abundant Access" vision established by the TMP Service Element.

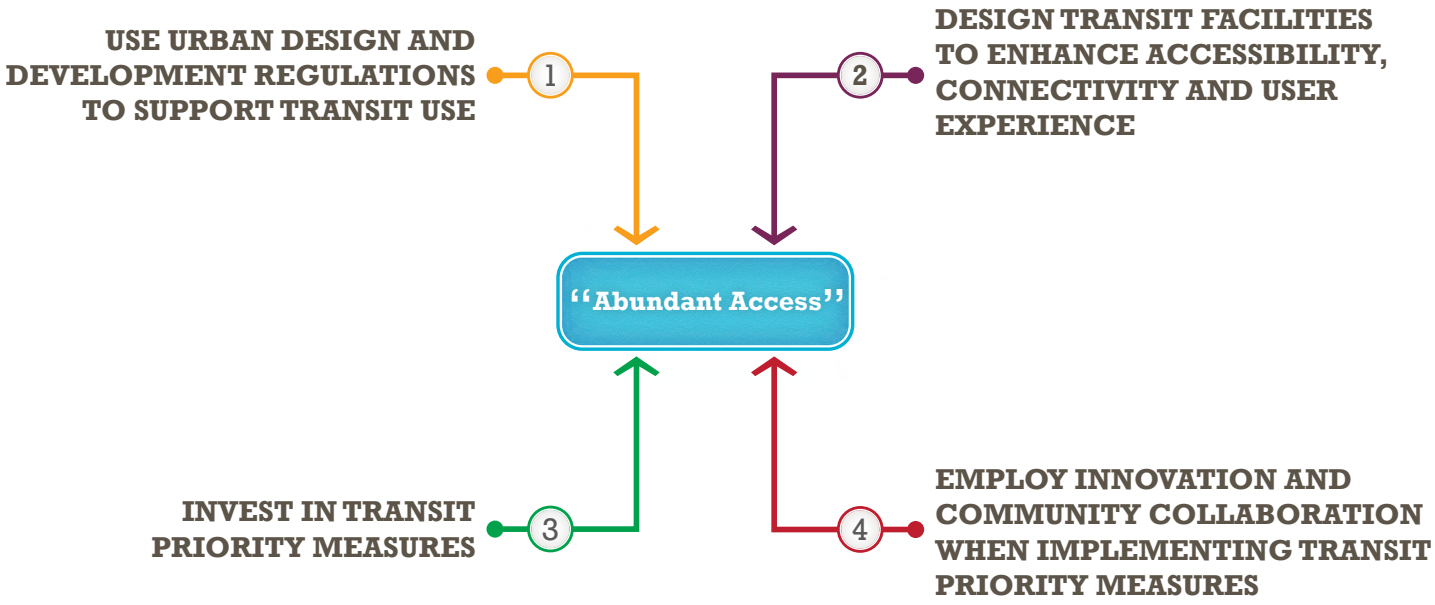


Figure 5 Transit Master Plan Project Principles, approved by the Bellevue City Council, July 9, 2012.

Draft

The City Council envisions a fully integrated and user-friendly network of transit services for Bellevue that supports the city's growth, economic vitality, and enhanced livability, and has developed the following set of project principles to direct development of the Transit Master Plan.

1. Support planned growth and development in Bellevue with a bold transit vision that encourages long-term ridership growth.	The dynamic nature of Bellevue's economic expansion requires a bold transit vision supported by practical, achievable strategies in the near term that set a solid foundation for longer term improvements through 2030. The Transit Master Plan should identify, evaluate, and prioritize transit investments that are responsive to a range of financial scenarios (cuts/status-quo/aspirational) and attune to different time horizons (near/mid/long term).
2. Engage community stakeholders in setting the priorities for transit delivery.	A comprehensive public engagement strategy should result in meaningful input on transit services and facilities from a range of stakeholders including residents, businesses, major institutions, neighboring cities, transportation agencies, and others (e.g., community associations, Network on Aging, Bellevue School District, Bellevue College, Chamber of Commerce, Bellevue Downtown Association). Special attention will be required to enlist the participation of "under-represented" communities such as immigrants, low-income and non-native English speakers.
3. Determine where and how transit investments can deliver the greatest degree of mobility and access possible for all populations.	The Transit Master Plan should look to the future and be compatible with Bellevue's land use and transportation plans and the challenges and opportunities of changing demographics, land use characteristics, and travel patterns. Following consultations with the community, demand forecasting, and a review of industry best practices and emerging technologies, this initiative will identify the steps required to create a public transportation system that is easy to use by all people in Bellevue for trips within Bellevue and to regional destinations.
4. Incorporate other transit-related efforts (both bus and light rail) underway in Bellevue and within the region.	The Transit Master Plan should incorporate local and regional transportation projects and plans that have been approved and/or implemented since the Bellevue Transit Plan was adopted in 2003. Transportation system changes include East Link, SR 520 expansion and tolling, and improvements to I-90 and I-405. Planning changes include the updated Bel-Red Subarea Plan, the Wilburton Subarea Plan and the Eastgate/I-90 Land Use and Transportation Project. Through coordination with local and regional transportation plans, the Transit Master Plan should outline a strategy to leverage the investment in public transportation projects to the benefit of Bellevue residents and businesses.
5. Identify partnership opportunities to further extend transit service and infrastructure.	While transit infrastructure is typically funded through large capital funding programs, other less traditional funding mechanisms can be utilized to pay for improvements vital to support transit communities and/or achieve higher transit ridership. The Transit Master Plan should undertake an analysis of partnership opportunities that the City might want to consider with other government organizations (e.g., Bellevue School District, Bellevue College, Metro, Sound Transit), human service agencies, and private corporations, to improve transit service delivery in Bellevue. This analysis will explore alternatives to traditional transit service delivery.
6. Develop measures of effectiveness to evaluate transit investments and to track plan progress.	The Bellevue Comprehensive Plan presently includes the following metrics/benchmarks related to transit: (i) mode split targets within each of the City's Mobility Management Areas [Table TR.1 – Area Mobility Targets]; (2) transit service frequency improvement targets between Downtown, Overlake, Crossroads, Eastgate, and Factoria [TR.8 – 10 Year Transit Vision]; and, (3) guidance found in 44 transit-supportive policies. The Transit Master Plan will revisit these metrics, and where necessary, propose modifications to better reflect present and future conditions.

Draft

Figure 6 Themes summarizing the input provided by particpants via keypad polling and discussion at the *Capital & Policy Workshop*.

1 Bellevue faces difficult choices about the use of its limited street right-of-way.

2 "It is neither possible nor desirable to build enough roadway improvements to keep pace with ever accelerating demand for travel in single-occupant vehicles. Rather, the Plan focuses on reducing auto dependency by providing viable travel choices."

3 In principle, high-ridership frequent transit deserves a higher priority than low-occupant private vehicles in access to limited road capacity.

4 Bellevue should manage its arterial travel lanes to maximize the throughput capacity for people rather than vehicles.

5 Transforming high-volume arterials into transit-supportive corridors requires careful and coordinated planning.

6 Bellevue needs to package its transit speed and reliability improvements with supportive land use policies, pedestrian and bicycle amenities, stop/station design, and transportation demand management strategies.

7 Bellevue should make transit the logical choice for a wide range of people and situations, by ensuring reliable operations.

8 Bellevue should consider pursuing bold investments in transit priority on some high-demand corridors by 2030.

9 Bellevue should consider broadening the transit priority toolbox.

Community Input

The Transit Master Plan obtained input from the community through a variety of means, each of which provided direction for the Capital Element planning process. The earliest and most expansive outreach was conducted via the web-based Bellevue Transit Improvement Survey, which generated input from over 4,200 respondents, including current riders, former riders, and those who have never used transit in Bellevue. The results of some questions with implications for the Capital Vision are depicted graphically in Figures 7 and 8. In September 2012, participants at the *Transit Master Plan Forum* spoke of the need to make the following types of strategic investments to grow ridership:

- "If you look at the demand for Downtown Bellevue, there's a much greater flow North-South, not East-West. We need Bus Rapid Transit on I-405." – Scott Lampe, Transportation Commission
- "I favor setting up high-ridership corridors for transit that serve high density areas." – Dallas Evans, Parks & Community Services Board
- "Until 2030, we'll just keep getting denser around East Link nodes…. If parking is free, people will use it…. If you don't build the parking, and if you have good transit, people will use it." – Hal Ferris, Planning Commission

The Transportation Department held the joint Board/Commission Capital and Policy Workshop in September 2013 to specifically address capital issues. Workshop participants engaged in a discussion about the appropriate degree to which transit should be given priority over other modes—if at all—and in which situations. This was considered both in terms of the language used in City policies and in relation to transit priority treatments along Frequent Transit Network corridors. Refer to Figure 6 and the *Capital & Policy Workshop Report* for additional information.

Draft

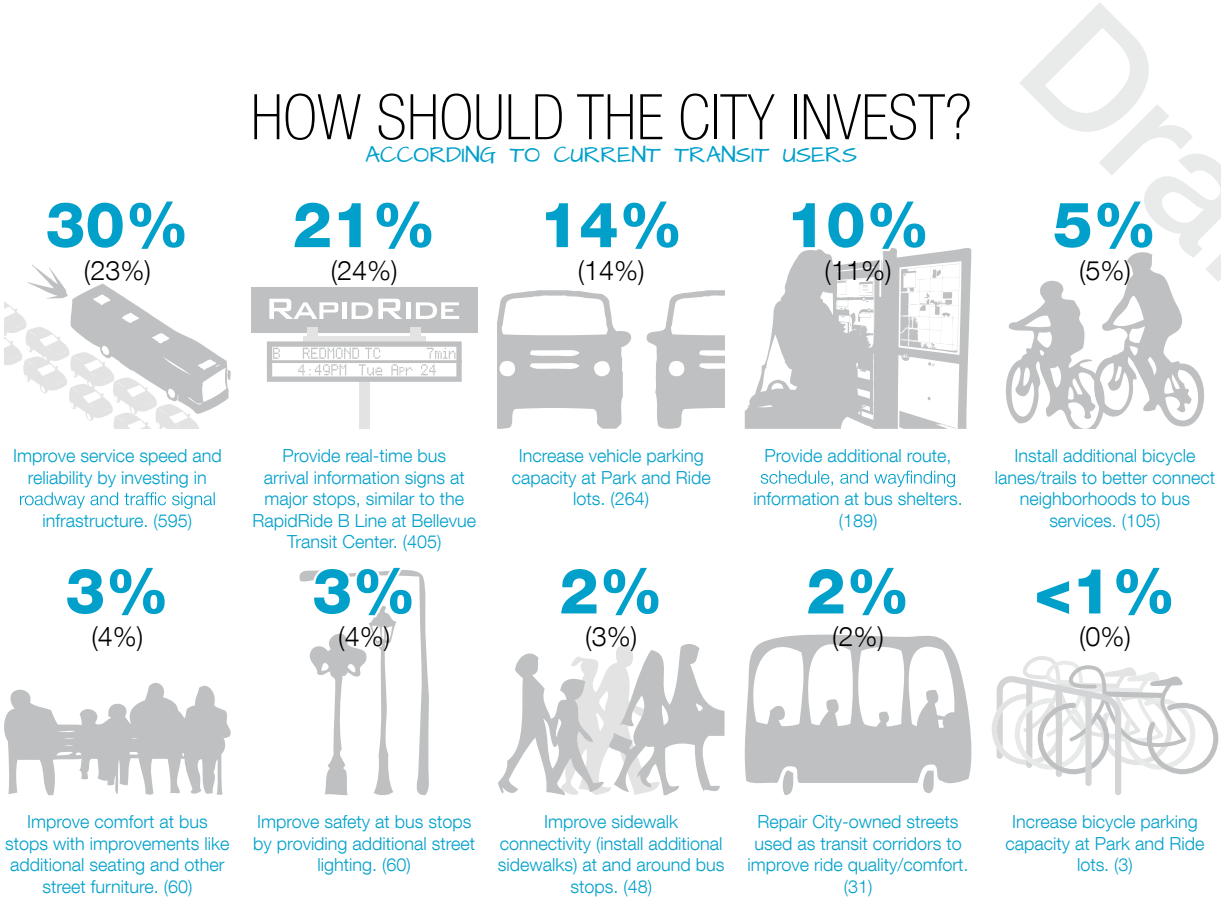


Figure 7 Priorities for municipal investment in transit among those who currently use transit services in Bellevue, according to the Bellevue Transit Improvement Survey. Large blue percentages reflect all current transit users, small black percentages in parentheses reflect all current transit users who reside in Bellevue, and small blue numbers in parentheses following each description reflect the total number of respondents.

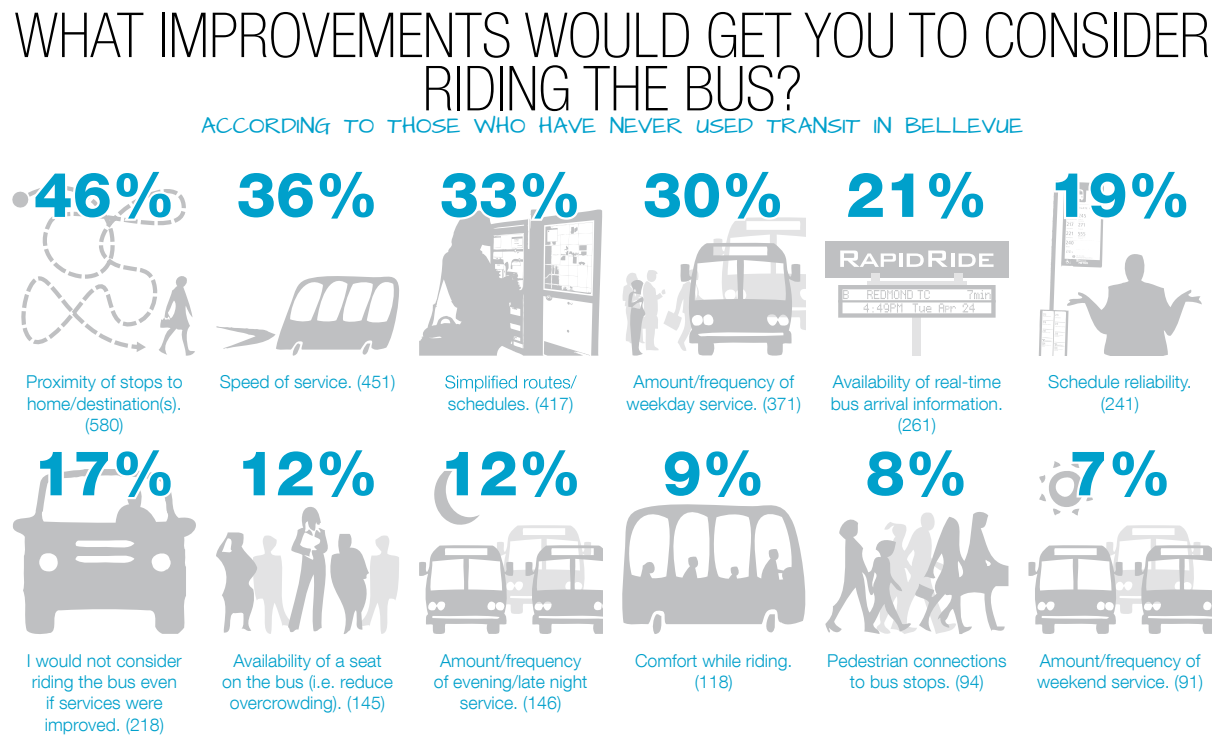


Figure 8 Factors that would encourage those who have never used transit services in Bellevue to consider doing so, according to the Bellevue Transit Improvement Survey. Large blue percentages reflect all respondents who identified as transit non-users; small blue numbers in parentheses following each description reflect the total number of respondents.

Draft

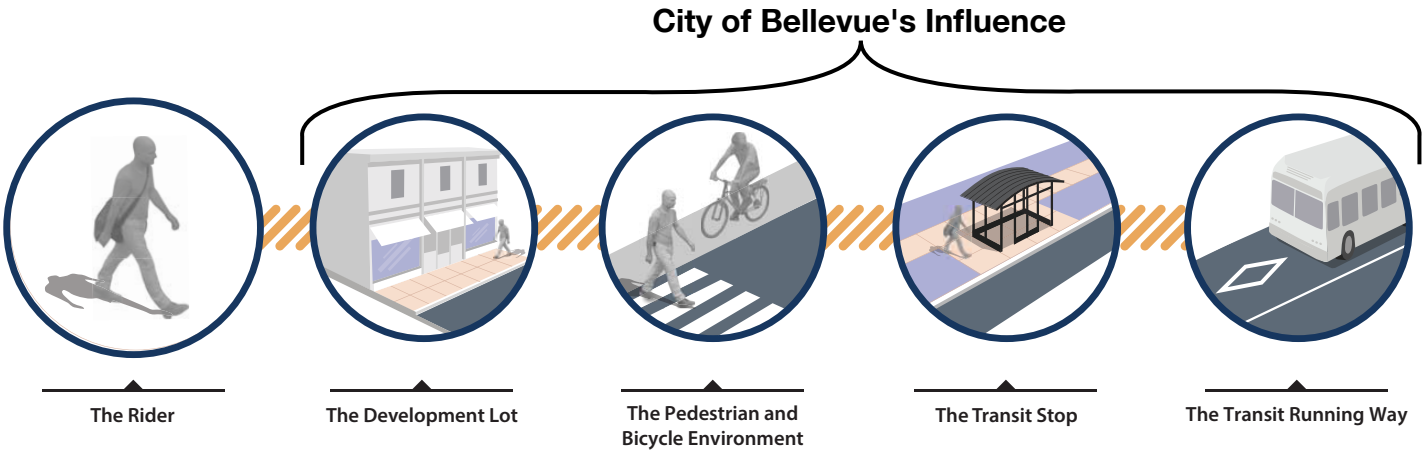
Report Organization

This report is divided into four sections based on the areas over which the City of Bellevue has influence on the attractiveness and performance of transit services locally. Although the City does not operate its own transit service, it has an influence over several important aspects of how well transit services are delivered. This includes influencing demand for transit by co-locating appropriate land uses to transit services, connecting pedestrians and bicyclists to the transit network, providing convenient, safe, and comfortable transit stops, and maintaining roadways, traffic signals, and other infrastructure that supports efficient and reliable operations. All aspects of the transit trip should be designed around the rider. These sections are organized in terms of both increasing specificity to transit operations and in the same order that they are experienced by transit users from the beginning of a transit trip. The following pages provide a brief review of each of the major issues addressed in each of these:

1. **The Development Lot** is where all transit trips begin. This section addresses the relationship between land use and transit services.
2. **The Pedestrian and Bicycle Environment** serves as the primary link between transit users' points of origin and transit services. More direct connections and hospitable facilities encourage greater use of transit.
3. **The Transit Stop** is the first point of contact between the passenger and the transit service. This is where pedestrians, bicyclists, and park-and-ride users transition from their mode of access to transit users.
4. **The Transit Running Way** encompasses the street rights-of-way on which transit services operate. While transit service providers define routes and schedules and operate the vehicles, the city builds and maintains roadway and traffic signal infrastructure, which significantly impact the speed and reliability of transit services.

Draft

Figure 9 Areas related to transit capital facilities over which the City of Bellevue has influence.

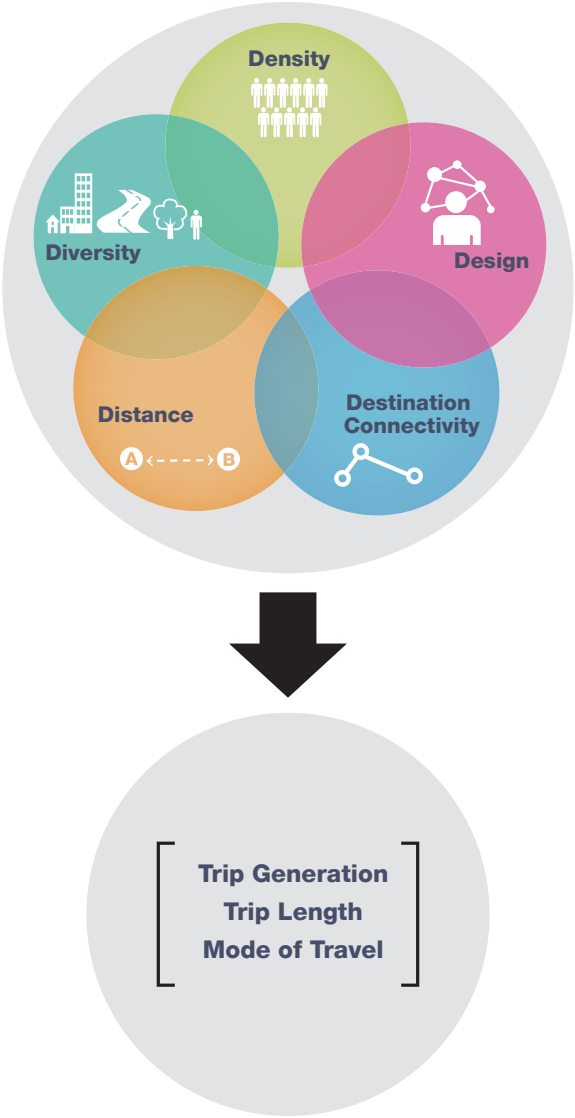


Draft

"Better [integrate] land use and transportation, so that people have more choices in how they move around. This will require better pedestrian linkages for new and existing developments, and a density and mix of land uses that encourage walking and transit in appropriate locations."

- Land Use Element, *City of Bellevue Comprehensive Plan (2004: 35)*

Figure 10 The "5 Ds" of the built environment that can encourage mode shift from single-occupant vehicles (SOVs) to alternatives like public transit.



THE DEVELOPMENT LOT

The Five Ds of the built environment—*density*, land use *diversity*, pedestrian-oriented *design*, *destination* accessibility and connectivity, and *distance* to transit—are commonly cited as the built environment factors that can encourage mode shift from single-occupant vehicles (SOVs) to public transportation, walking, and bicycling. The development lot represents both the origin and destination of every transit trip and relates to the first three Ds. The development lot includes parcels of private property (e.g. housing, offices, commercial services) and public places (e.g. schools, community centers, parks). The density, diversity, and design of these places are influenced by the zoning and subdivision regulations designated in the Comprehensive Plan.

Bellevue is a city with substantial variety in land uses, development types, and urban form. The city's diverse neighborhoods have developed over a period of many decades, each reflecting the prevailing trends and consumer preferences of their time. Residential areas range from low-density single-family subdivisions and equestrian lots to mid- and high-rise apartments and condominiums. Emplyoment centers have developed in several parts of the city, ranging from auto-oriented retail and office park developments with large surface parking lots and building setbacks to the dense, mixed-use, increasingly walkable Downtown core.

Although the character of many areas will generally remain as they are today, particularly Bellevue's established single-family residential neighborhoods, other areas will realize significant changes in the coming years. Bellevue's Comprehensive Plan—currently undergoing its decennial update—notes that a mix of employment and residential uses will continue to concentrate in Downtown, one of the major urban centers in King County. As the city center continues to grow, providing people with

more transportation choices will be a key to realizing the viable, livable, memorable Downtown with a strong and diverse economy that the plan envisions. Additionally, the Bel-Red area, historically the city's warehouse and manufacturing district, is transitioning into an area of mid-rise mixed-use office, retail, and residential land uses, coinciding with the extension of Sound Transit's regional light rail network through the area.

While it is neither necessary nor recommended that all places look and function the same, it is important to recognize that some fundamental characteristics of urban form and site design increase the likelihood that an area will support access to and the operation of transit. The Transit Master Plan "Abundant Access" vision statement aims to provide "efficient, useful, attractive service for the most people, to most destinations, most of the time, serving maximum ridership." Thus, while coverage services will be provided to the extent possible with available resources, when trade-offs are required, places that foster more productive service are prioritized. For additional information about the Service-Oriented Strategies and future transit networks proposed by the Transit Master Plan, refer to the *Market-Driven Strategies Report* and *Transit Service Vision Report*.

Unlike the other three sections of the Transit Capital Vision Report, the Development Lot section does not propose new capital projects (like the Transit Running Way), advocate for the prioritization of existing projects (like the Pedestrian and Bicycle Environment), or identify issues warranting additional analysis or work programs (like the Transit Stop). Instead, the Development Lot section simply acknowledges the important relationship between land use, urban design, and effective transit planning. For more information, refer to the full section on The Development Lot beginning on page 25.

Figure 11 Artist rendering of the future Bel-Red area—a transit-oriented, mixed-use neighborhood following the introduction of East Link light rail in 2023.

Figure 12 The Bellevue College Connection (Project L27) will contribute to the integration of a balanced transportation system in Eastgate that emphasizes transit and non-motorized connectivity with Bellevue College and a cluster of mixed-use residential, retail, and office buildings around a new pedestrian-friendly "main street" envisioned east of the park-and-ride.

Draft

THE PEDESTRIAN AND BICYCLE ENVIRONMENT

A transit system involves the superimposition of two networks: the access network, used by people to reach the system, and the service network provided by bus operators, with the bus stop serving as the point of connection between the two. All transit users are thus pedestrians for some part of their trip. The provision of an accessible pedestrian network is therefore an essential component of a useful transit system. If potential transit users are unable to reach a bus stop easily, quickly, and reasonably directly, they are more likely to consider alternative travel modes if any are available to them.

This section identifies which existing pedestrian and bicycle projects proposed by other planning efforts would specifically improve non-motorized access to transit. Unlike the 'Transit Running Way' section of this report, this section does not propose any new projects, nor does the basic assessment presented here assign any priority ranking (e.g. high/medium/low) to a project for which this has not already been done. This represents only a first-level of screening for identifying pedestrian and bicycle projects that should be considered a priority from the perspective of transit.

In assessing which pedestrian and bicycle projects should be prioritized from the perspective of transit, the projects of interest are those that are proximate to bus stops. For the purposes of this preliminary screening, any project that has some portion within one quarter-mile of an FTN bus stop was selected and identified as being a priority to transit. Those 342 projects are shown in Figure 13 relative to the 2030 FTN service area, and the complete list is provided in Appendix B1. A more detailed analysis leveraging more complex accessibility metrics will propose a means of prioritizing non-motorized projects based on the degree to which they improve one's ability to access transit. For more information, refer to the full section on The Pedestrian and Bicycle Environment beginning on page 35.

Table 1 Preliminary screening of transit priority pedestrian and bicycle projects.

Project Type	High Priority*		Total PriorityPed-Bike Projects	
Sidewalk Projects	89	57.8%	**154**	**45.0%**
Bicycle Projects	48	40.7%	**118**	**34.5%**
Offstreet Path Projects	11	29.7%	**37**	**10.8%**
Trail Projects	18	62.1%	**29**	**8.5%**
Multimodal Intersections	0	0.0%	**4**	**1.2%**
All Projects	166	48.5%	**342**	

Note: Percentages in the center column reflect the number of each project type rated as High Priority. Percentages in the right column reflect the number of total projects of each type.

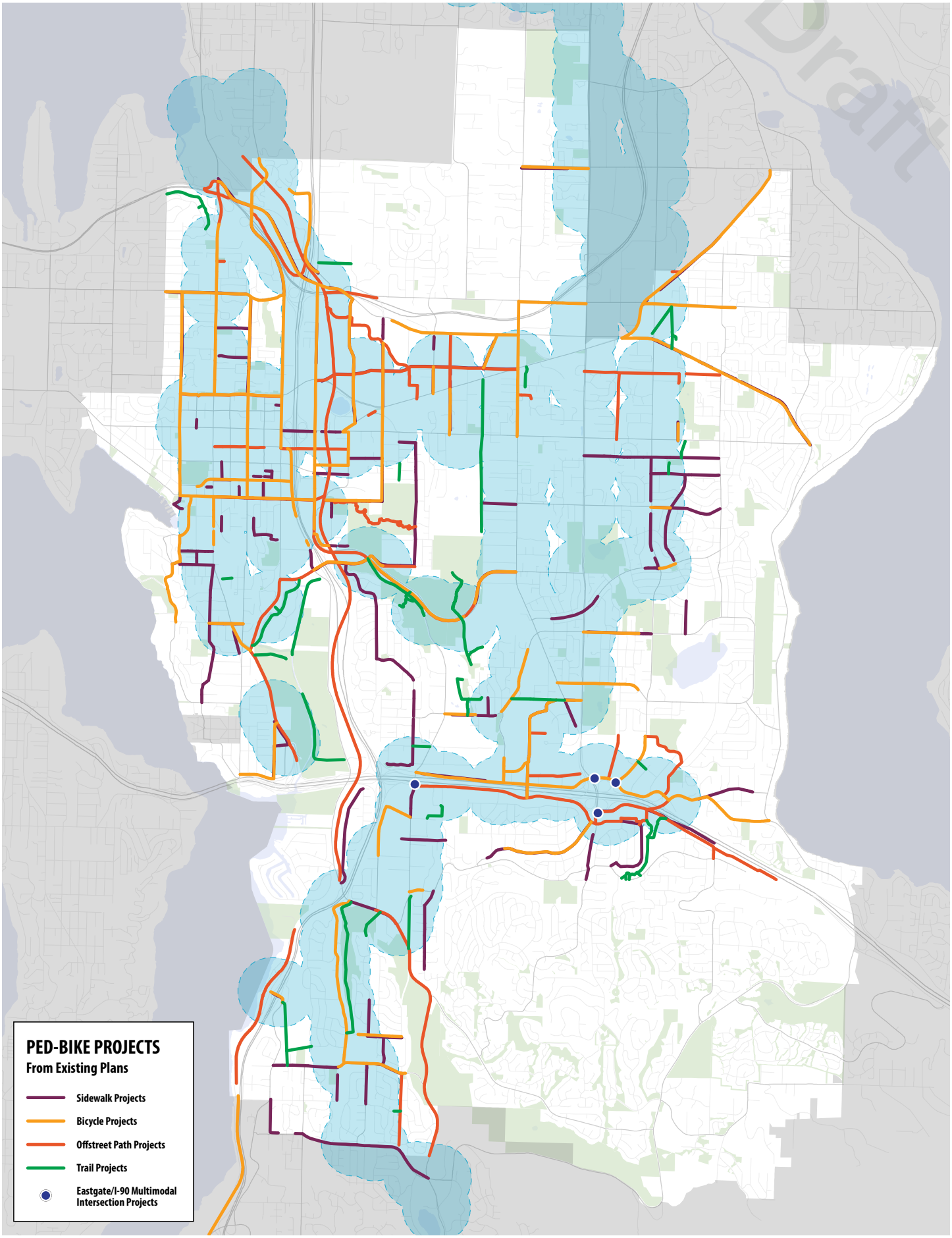
*Projects rated High Priority by the 2009 Pedestrian-Bicycle Plan project prioritization process.

Table 2 Forecast (2030) populations in Bellevue with access to frequent transit services (15-minute headways or better) based on quarter-mile radial catchment areas.

Funding Scenario	2030 Projections					
	Employment		Household Pop.		Population	
	%	Total	%	Total	%	Total
Growing	82.2%		58.1%		51.2%	
Stable	82.2%	184,300	57.7%	70,300	50.9%	157,400
Reduced	82.2%		57.8%		50.9%	

Note: 2030 projections are based on for

Figure 13 Preliminary transit priority pedestrian and bicycle projects.



Draft

Figure 14 Transit use patterns in Bellevue based on Fall 2011 boarding and alighting (on/off) data.

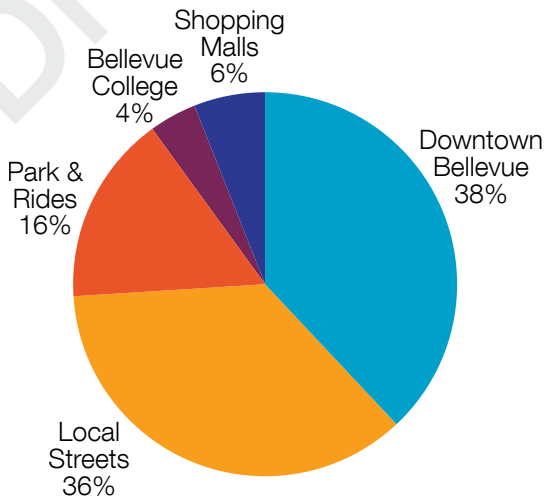
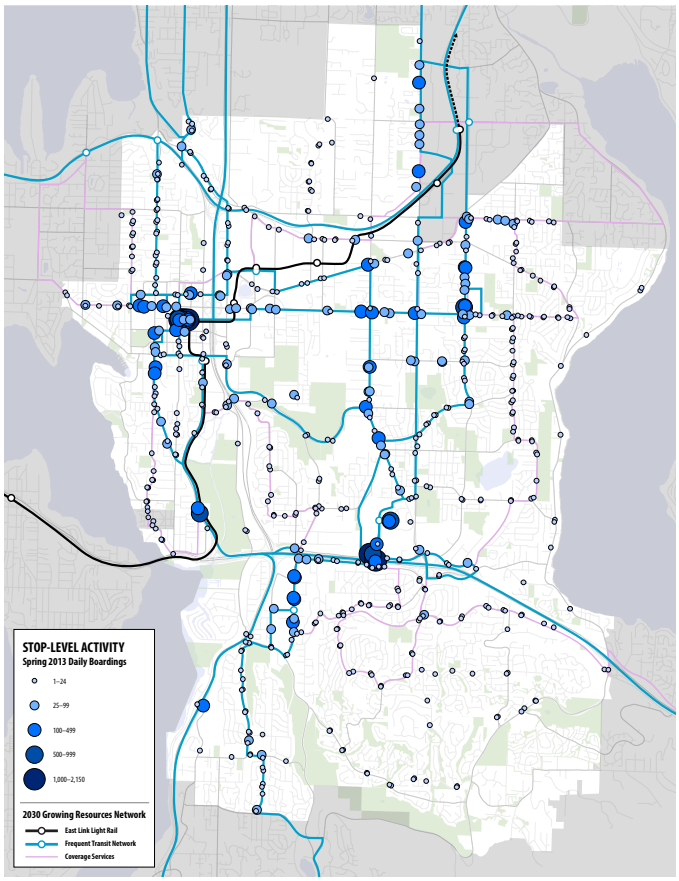


Figure 15 Stop-level daily boardings (ons) in Spring 2013. The route network of Frequent and Coverage services from the 2030 Growing Resources network are shown for reference.



THE TRANSIT STOP

The transit stop is the first point of interaction between the transit user and the transit system. The efficient placement of bus stops near major destinations with well-connected pedestrian and bicycle facilities helps to provide communities with viable transportation choices by making the entire transit trip shorter and more pleasant. Also important to the ability of transit to attract ridership is the quality and comfort of the transit stop and its environment.

The Transit Master Plan (TMP) will not make specific recommendations about bus stop locations for the route networks defined in the *Transit Service Vision Report* beyond that document's general stop spacing guidelines based on the various service types defined. Instead, this section focuses on three other subjects related to the transit stop: bus stop amenities, commuter parking, and bus layover needs. The first two of these subjects relate primarily to how transit users experience their first point of contact with the transit system, while the third deals with operational considerations.

Bus Stop Amenities

As of Fall 2011, 84 percent of boardings and alightings in Bellevue took place outside of park-and-ride lots, with 36 percent at bus stops on local streets (Figure 15). Waiting area amenities increase the convenience, comfort, safety, and usefulness of bus stops and influence the overall attractiveness of public transportation. Stop locations that are designed with paved waiting pads, shelters, benches, lighting, windbreaks, route information, trash bins, bicycle racks, and, in some cases, off-board pay stations and real-time arrival information make bus stops more hospitable places to be. The most fundamental of the various bus stop amenities is the bus shelter, which provides protection from the elements and

seating. Several factors influence the determination of need for various stop amenities. For stop shelters, the primary consideration is stop-level passenger activity. King County Metro's bus shelter warrant standard requires shelters to be installed at stops with 25 or more average daily boardings. Figure 15 depicts the number of stop-level daily boardings (ons) at all bus stops served in Bellevue in Spring 2013. Forty-three stops serve sufficient daily boardings to warrant a stop shelter but currently have no form of cover provided (refer to Appendix C1 on page A205).

Commuter Parking

Commuter parking facilities play an important role in concentrating transit rider demand, often in lower-density areas that would otherwise be unable to support frequent services. These facilities provide convenient access to transit via automobile or bicycle for people who do not live within convenient walking distance of a standard bus stop. By supporting the use of alternatives to the single-occupant vehicle, park-and-rides help to reduce the need for increasing roadway capacity as the region grows. Further, by concentrating transit boardings at a single point, a more frequent level of service can be supported.

A review of park-and-ride usage in the Puget Sound region over the past ten years reveals two trends. First, there is an uneven regional distribution of park-and-ride use. Several lots east of Bellevue and/or an inconvenient distance from the Frequent Transit Network (FTN) are under-capacity, while several lots in western Bellevue such as the South Bellevue Park-and-Ride are over-capacity, as shown in Table 3. This imbalance of lot usage indicates that lot location in relationship to the FTN is an important factor to consider when siting new facilities. Second, there is a trend of increasing utilization of park-and-

Table 3 2013 park-and-ride and leased lot capacity and usage.

Park-and-Ride Facility	Lot Capacity	% Occupancy
Park-and-Ride Lots:		
Eastgate	1,614	99%
Newport Hills	275	84%
South Kirkland (Bellevue and Kirkland)	783	75%
South Bellevue	519	107%
Wilburton	186	87%
Total	**3,377**	
Leased Lots:		
Bellevue Christian Reformed Church	20	38%
Bellevue Foursquare Church	35	20%
Eastgate Congregational Church	20	100%
Grace Lutheran Church	50	100%
Newport Covenant Church	75	24%
Newport Hills Community Church	37	64%
St. Luke's Lutheran Church	30	18%
St. Andrew's Lutheran Church	20	63%
Total	**351**	

Figure 16 Potential lease lots within one-quarter and one-half mile radial catchment areas of 2030 Frequent Transit Network stops.

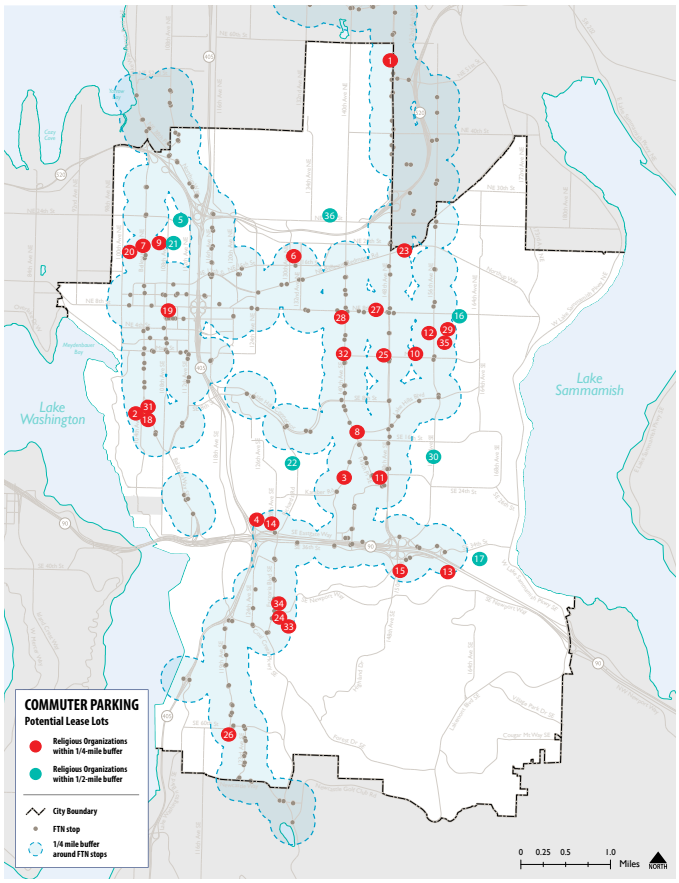
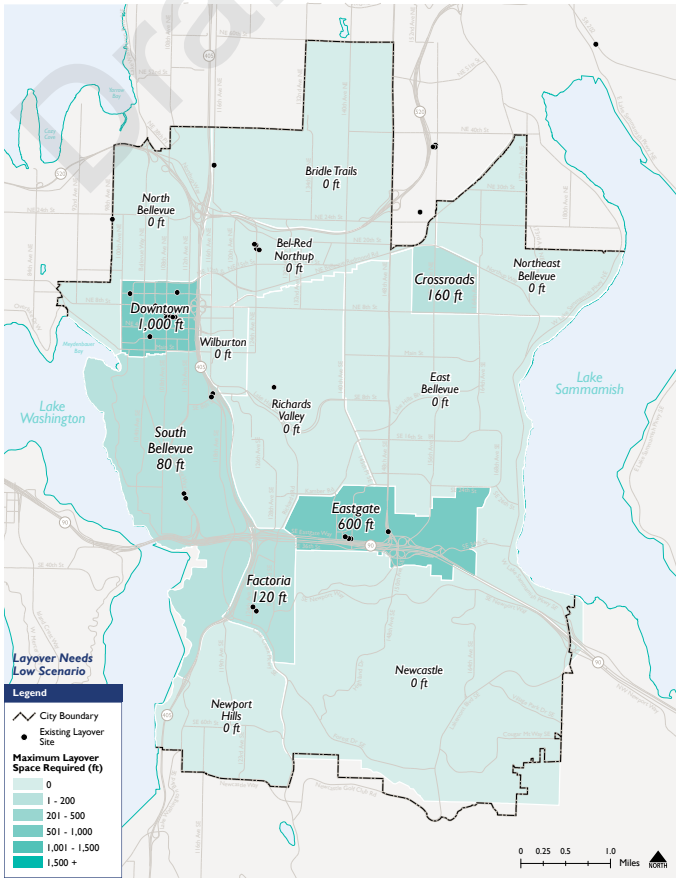
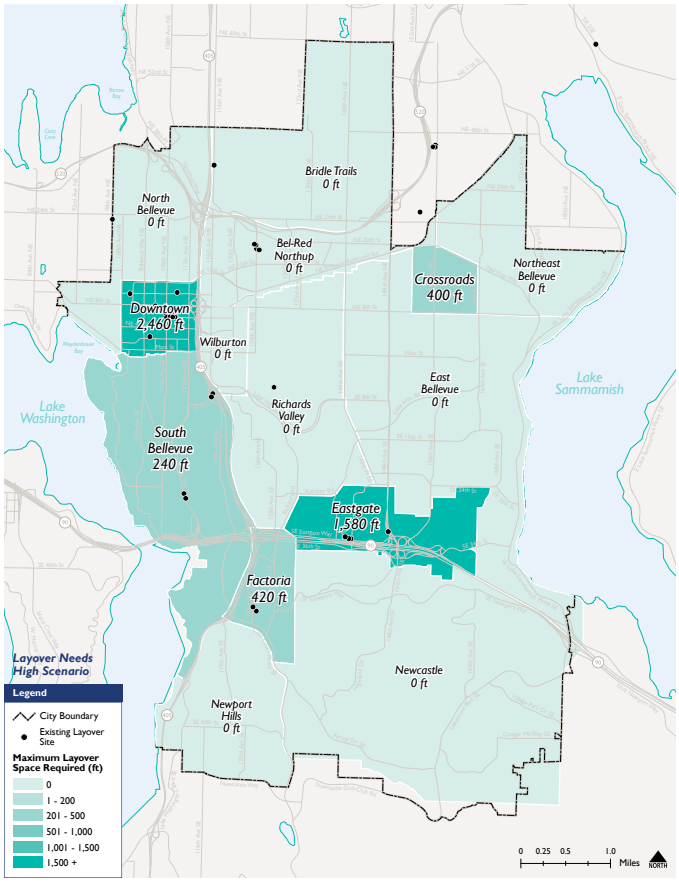


Figure 17 Bus layover needs in linear feet by Mobility Management Area (MMA): low estimate (top) and high estimate (bottom).





ride lots overall, with the two study corridors reflecting a 63 percent increase between 2000 and 2013.

This section also reviews 2030 projected commuter parking demand for the I-405 and I-90 corridors, considers this demand in light of existing parking facilities, and determines that there would be an undersupply of parking stalls available along these corridors if the 2030 Growing Resource network is implemented as proposed. If an unlimited supply of parking were available along each of the corridors (unconstrained demand), the I-90 corridor would be short by approximately 6,300 park-and-ride stalls, and the I-405 corridor would be short by approximately 4,600 stalls. Model results show that unconstrained demand is approximately 200 percent greater than constrained demand, suggesting that new riders will likely begin using the system given increased parking availability.

Leased lots, which are shared use park-and-ride lots, often blend in well with the character of residential neighborhoods and are a good tool to use to better serve low-density residential areas. If all churches within a half-mile walking distance of the FTN were to share their parking, over 4,700 stalls would become available, and churches that are within one quarter-mile radius of FTN transit stops have more than 3,500 parking stalls available. Figure 16 provides a reference map showing the twenty-five church locations that fall within a quarter-mile radius of FTN stops, as well as the seven additional churches that are within a half mile walking distance.

Bus Layover Needs

The layover, or amount of time between the end of one trip and the start of the next trip, requires that space be provided at transit facilities or designated along nearby streets or parking lots for transit vehicles to park while not in service. Inefficiencies result when vehicles must travel from their route

terminal to reach the layover location. Understanding how much layover space will be required and where that space can most efficiently be accommodated can help to ensure that the scarce regional transit resources allocated to Bellevue are used to provide service to passengers, not lost to operational inefficiencies.

This report does not attempt to identify specific locations at transit facilities or along street right-of-ways to be used by transit vehicles for layover. Instead, it provides an estimate of the range of total linear feet of layover space that will be required to operate the 2030 Growing Resources Network. The estimation conducted determined that the maximum layover requirements—that is, the amount needed during the time of day when the most buses are in operation—will range from 3,560 to 8,480 feet, depending on the assumptions used in the calculation. (The two maps in Figure 17 depict the high and low layover need estimates by Mobility Management Area.)

For each of the variables in this analysis, the assumed conditions are appropriate and applicable in some cases but either too conservative or excessive in others, depending on site- and service-specific needs. These estimates should therefore be interpreted as the extreme lower and upper bounds of what may be necessary, with the actual amount of layover space required falling somewhere in between. It is estimated that approximately 7,000 feet of layover space currently exist in the study area that includes Bellevue and portions of other Eastside communities. While this total might be sufficient to accommodate the projected needs in aggregate, future proposed routes have different terminals than existing routes, so additional analysis will be required in the coming years to determine where these needs can be optimally accommodated.

For more information about each of the three subjects summarized here, refer to the full section on The Transit Stop beginning on page 57.

Draft

Figure 18 Bellevue Transit Center.

Figure 19 Eastgate Park-and-Ride.

Figure 20 Downtown Bellevue HOV Access.

Completed Projects

Since the adoption of the 2003 *Bellevue Transit Plan*, hundreds of millions of dollars in HOV access ramps, transit centers, park-and-ride lots, and speed and reliability projects were completed in Bellevue in support of transit operations. Transit capital projects completed since 2003 include:

Bellevue Transit Center – In 2003, Sound Transit expanded the Bellevue Transit Center to include ten bus bays, shelter improvements, and rider amenities. Additional bus stops and roadway improvements on 108th Ave NE, 106th Ave NE and east of the transit center on NE 6th St have improved transit and traffic flow in Downtown Bellevue and enable more than 100 buses during peak periods to move efficiently through the transit center. *Total funding: $16 million.*

Eastgate Park-and-Ride Expansion – In 2004, King County expanded the Eastgate Park-and-Ride from a 696-stall facility to a structured complex that can accommodate 1,646 vehicles. In spite of the large number of parking spaces, the Eastgate Park-and-Ride is already at capacity with a utilization ratio of 97 percent (Q2 2012). *Total funding: $27 million.*

Downtown Bellevue HOV Access – Completed in 2005, the Bellevue HOV Access project makes it easier to travel in an out of Downtown Bellevue from the freeway. The project provides a new interchange on I-405 at NE 6th St for buses and carpools, giving buses direct access to the expanded Bellevue Transit Center. It improves freeway interchanges at NE 4th St, NE 8th St, and SE 8th St, including improvements to nearby city street intersections. *Total funding: $144 million.*

Eastgate Direct Access Ramp – WSDOT and Sound Transit partnered in 2006 to complete the Eastgate Transit Access project to connect the existing 142nd Pl SE bridge to I-90 HOV lanes. The addition of two ramps (one each on the east and west sides of I-90) allows a direct connection for bus and HOV users to 142nd Pl SE and the Eastgate Park-and-Ride without having to cross the general lanes to exit the highway. *Total funding: $19 million.*

Figure 21 Eastgate Direct Access Ramp.

I-90 Two-Way Transit & HOV Operations – WSDOT and Sound Transit are working together to improve on-time reliability and access for transit and HOVs on I-90. The project will provide full-time HOV lanes for eastbound and westbound traffic on the outer I-90 roadways and will retain the existing reversible lane operations in the center roadway until East Link light rail construction is ready to begin. HOV direct access on- and off-ramps will enable buses and carpools to access the HOV lanes without crossing other lanes of traffic. The project is being implemented in three stages: stages 1 and 2 were completed in 2009 and 2012, respectively; the third and final stage is in design with construction expected to be complete in September 2016. *Total funding: $188 million.*

Figure 22 I-90 Two-Way Transit & HOV Operations.

RapidRide B Line – King County Metro's RapidRide B Line started running between the Downtown Bellevue and Redmond Transit Centers via Crossroads and Overlake in 2011. Customers enjoy enhanced frequencies (service at least every 10 minutes during the busiest morning and evening travel hours and 15 minute service during off-peak periods), real-time bus arrival signs, well-lit shelters, and speed and reliability enhancements offered by transit signal priority (TSP). *Total funding for roadway improvements, communication network, stations and stops and associated amenities: $10 million.*

Figure 23 RapidRide B Line inauguration ceremony.

Draft

Table 4 Summary of speed and reliability projects by type.

Project Type	No. of Projects
Running Way Improvements	19
HOV Lanes	8
BAT Lanes	6
Roadway Construction	5
Spot Improvements	39
Queue Jump Lanes	16
Intersection and Roadway Improvements	13
Signalization Improvements	10
TSP Projects (Near-term)	44
Tracking & Additional Study	5
Total	107

Table 5 Summary of speed and reliability projects by cost.

Estimated Project Cost	No. of Projects
No Cost (NC) These projects primarily require staff time to track, review, or revise using existing City resources and staff time.	6
Tens of Thousands ($) These projects primarily include low-cost changes like striping or signal equipment additions or modifications. These projects do not involve any physical changes.	66
Hundreds of Thousdands ($$) These projects include more significant striping or signal modification, which could include some small physical modifications to an intersection or signal. More significant projects include lane construction at intersection approaches assuming minimal land acquisition, environmental mitigation, and slope stabilization.	16
Millions ($$$) These projects include construction of new lanes through multiple intersections and/or construction of new lanes along intersections where constraints exist.	18
Not Applicable (N/A) This project highlights a need for improvement but does not recommend a specific solution. Further study of the situation will only require staff time to complete (i.e., no cost), and the cost of subsequent actions can only be estimated after the chosen solution is identified.	1
Total	107

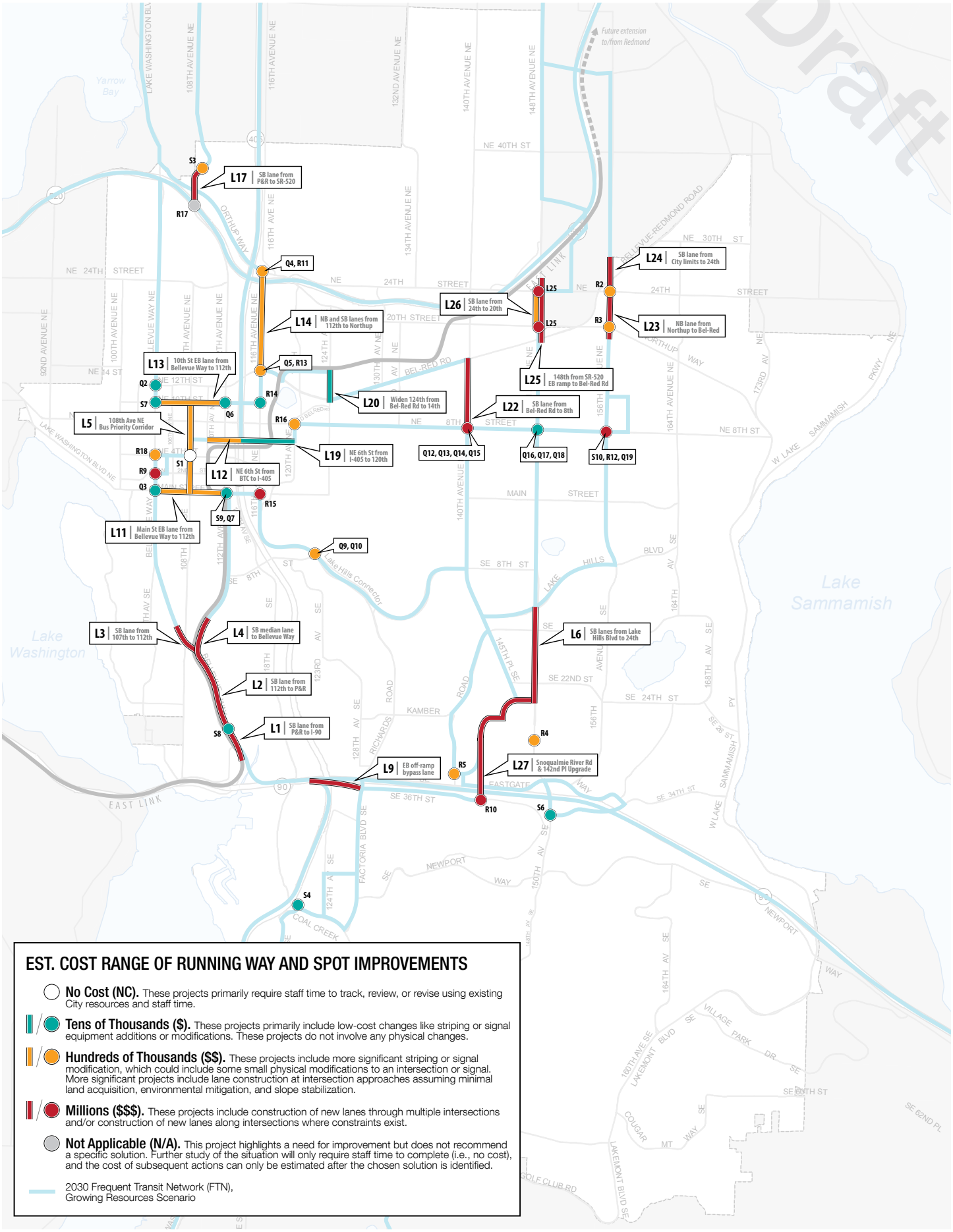
Proposed Transit Speed and Reliability Projects

Similar to the projects implemented in the ten years since adoption of the 2003 Transit Plan, the Capital Vision identifies a total of 107 capital projects that would benefit transit speed and reliability. As shown in Table 4, these include 19 running way improvement projects, 39 spot improvement projects, 5 tracking and additional study projects, and 44 near-term transit signal priority (TSP) projects.

These include some existing projects already adopted in the Transportation Facility Plan (TFP) and/or Transportation Improvement Program (TIP), previously proposed projects from past planning efforts (e.g. Eastgate/I-90 Land Use and Transportation Project, Downtown Transportation Plan Update), and numerous new projects conceived during the TMP Capital Element planning process. New projects were advanced through a multi-stage process that began with the development of a transit priority toolbox, was followed by a geographic information system- (GIS-) based issue identification analysis, and ultimately proceeded through several iterations of project feasibility screening. Travel demand modeling was used to provide some inputs into the issue identification analysis, and micro-simulation models were used to help assess the potential degree of benefit provided by certain subsets of the total project list.

General cost estimates were identified for each project, as summarized in Table 5. Figure 24 maps the location and estimated costs of all running way and spot improvement projects, as well as two location-specific tracking projects. Citywide tracking projects and TSP projects are not included in the map, the latter because they are too numerous to include in a single map together with the others. Refer to Figure 152 on page 170 for a map of the near-term TSP projects being proposed.

Figure 24 Transit running way and spot improvement projects by estimated cost range.



Draft

Long-Term Project Prioritization Criteria

Base Priority Identification:

1.) Long-Term Corridor Composite Score(s)

- High: 19–24
- Medium: 16–18
- Low: N/A–15

Priority Refinement:

2.) Current TFP/CIP Projects

3.) Projects specifically required to implement future FTN route structure

- Project L19: NE 6th St Extension
- Project L27: Bellevue College Connection

4.) Projects for which the Transportation Commission has provided specific guidance

- Project L27: Bellevue College Connection
- Project L11: Main St HOV Lane
- Project L13: NE 10th St HOV Lane

Table 6 Summary of long-term speed and reliability project prioritization.

Preliminary Prioritization	Total Projects	Project Type	
		Running Way	Spot Improvement
High	20	10	10
Medium	21	8	13
Low	17	2	15
Total	58	20	38

Note: Both the running way and spot improvement categories each include one more project than these categories do in Table 4 on page 20 because each includes one tracking project identified in Figure 25.

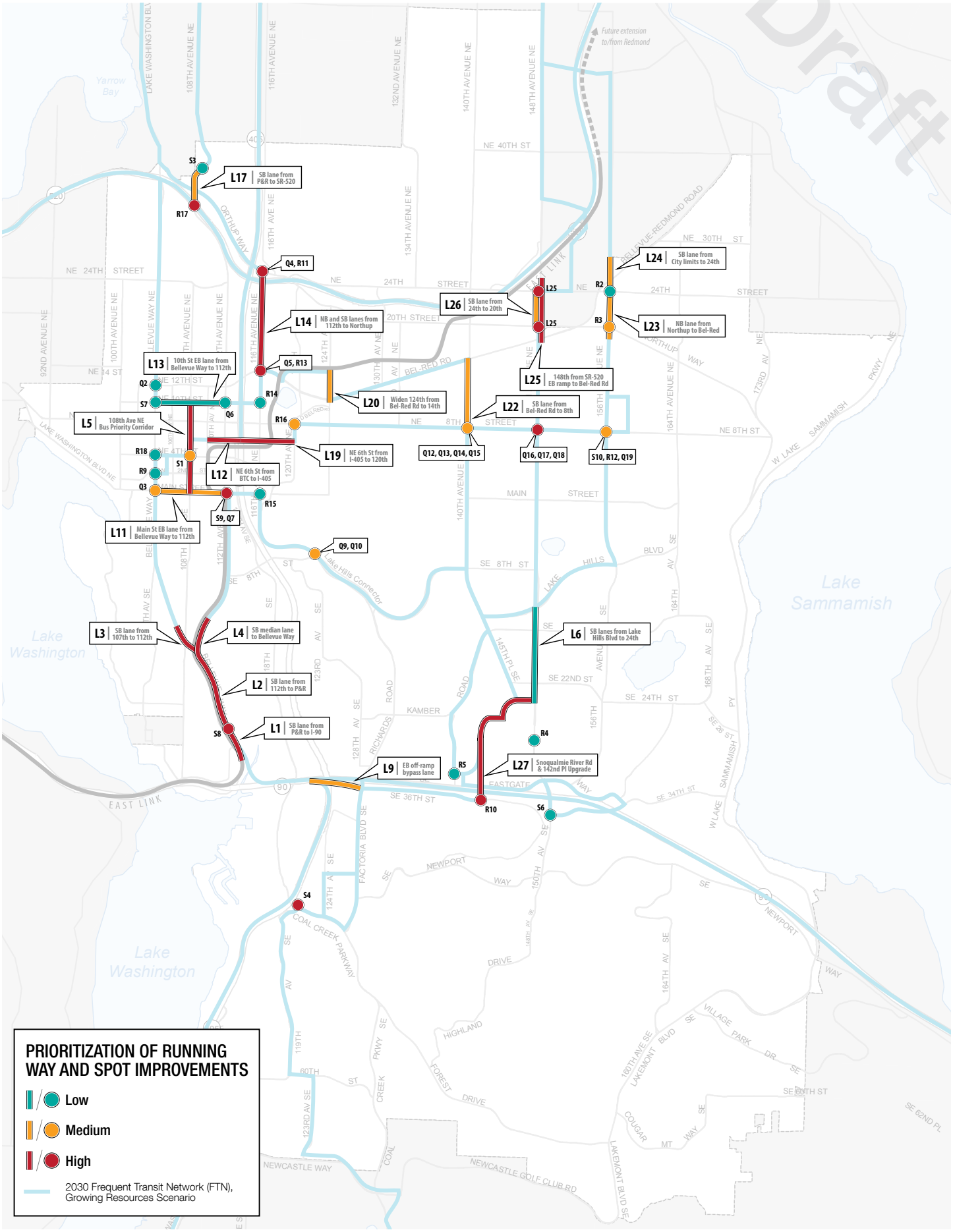
Project Prioritization

The Transportation Commission assigned priorities to each of the running way, spot improvement, and location-specific tracking projects presented in this report. The results of this priorization are summarized in Table 6 and mapped in Figure 25. The long-term prioritization criteria are summarized here and described in greater detail on pages 150 through 155.

The purpose of prioritizing the proposed capital projects is to maximize the value to the Frequent Transit Network (FTN). Thus, the FTN's long-term composite scores serve as the primary means of identifying a project's priority. The ranges for High, Medium, and Low Priority (shown at left) are consistent with the categories shown on the map shown in Figure 135 on page 143. For projects characterized by a range of composite scores, the average of the maximum and minimum scores was used to determine a project's base priority. These initial priority assignments were then refined according to three separate considerations. First, if a proposed project has already been adopted by the Transportation Facilities Plan (TFP) or Capital Investment Program (CIP), that project's priority was increased by one category. The same action was taken if a project is specifically required to implement the 2030 FTN route structure. Finally, if the Transportation Commission provided specific guidance about a project during the Capital Element planning process, that project's priority was increased or decreased by one category accordingly.

The Bellevue College Connection (Project L27) provides an instructive example of a project affected by several of the refinement considerations. Though its base priority is Low because much of that corridor is not affected by general purpose traffic, its final prioritization is High because it is has an associated TFP project (TFP-252), is necessary to restructure service between Eastgate and Bellevue College, and was identified by the Transportation Commission as being of specific interest to pursue as soon as possible.

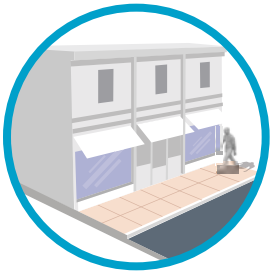
Figure 25 Prioritization of the proposed transit running way and spot improvement projects.



Draft

This page intentionally left blank.

Draft



SECTION 1:
THE DEVELOPMENT LOT

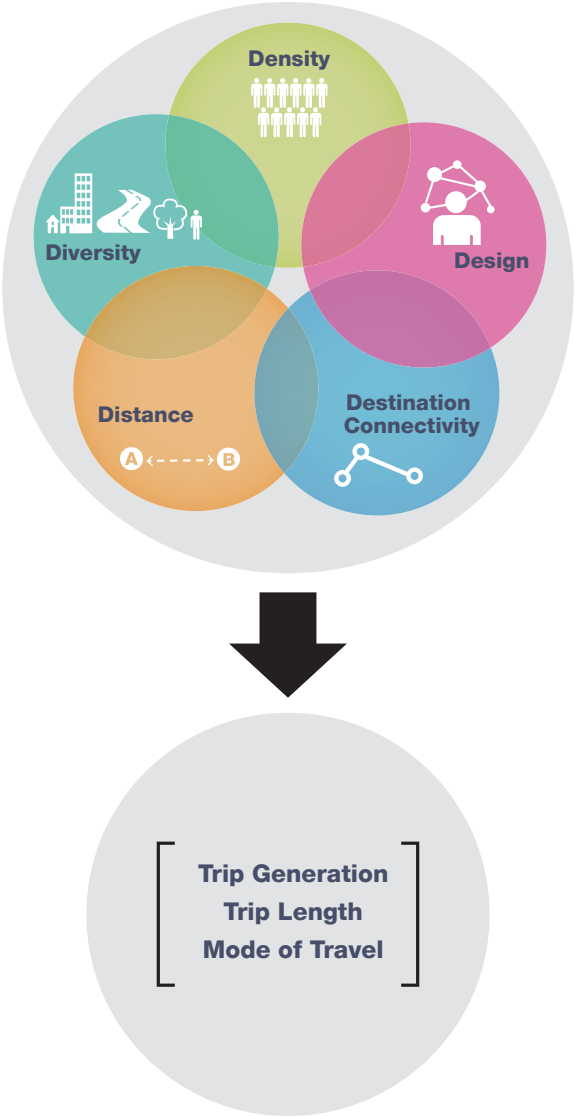
Draft

COORDINATING TRANSIT AND LAND USE

The Five Ds of the built environment—*density*, land use *diversity*, pedestrian-oriented *design*, *destination* accessibility and connectivity, and *distance* to transit—are commonly cited as the built environment factors that can encourage mode shift from single-occupant vehicles (SOVs) to public transportation, walking, and bicycling (see Figure 26). The development lot represents both the origin and destination of every transit trip and relates to the first three Ds. The development lot includes parcels of private property (e.g. housing, offices, commercial services) and public places (e.g. schools, community centers, parks). The density, diversity, and design of these places are influenced by the zoning and subdivision regulations designated in the Comprehensive Plan.

Bellevue is a city with substantial variety in land uses, development types, and urban form (see Figures 29–32 for a sampling of development types in Bellevue). Factors that differentiate development types include urban structure (the spatial layout of a city), density (in terms of residential and employment), and design (site configuration and the dimensions and design of elements in the public realm). All of these factors affect the performance of transit in a community. The city's diverse neighborhoods have developed over a period of many decades, each reflecting the prevailing trends and consumer preferences of their time. Residential areas range from low-density single-family subdivisions and equestrian lots to mid- and high-rise apartments and condominiums. Emplyoment centers have developed in several parts of the city, ranging from auto-oriented retail and office park developments with large surface parking lots and building setbacks to the dense, mixed-use, increasingly walkable Downtown core.

Figure 26 The "5 Ds" of the built environment that can encourage mode shift from single-occupant vehicles (SOVs) to alternatives like public transit.



Although the character of many areas will generally remain as they are today, particularly Bellevue's established single-family residential neighborhoods, other areas will realize significant changes in the coming years. Bellevue's Comprehensive Plan—currently undergoing its decennial update—notes that a mix of employment and residential uses will continue to concentrate in Downtown, one of the major urban centers in King County. As the city center continues to grow, providing people with more transportation choices will be a key to realizing the viable, livable, memorable Downtown with a strong and diverse economy that the plan envisions. Additionally, the Bel-Red area, historically the city's warehouse and manufacturing district, is transitioning into an area of mid-rise mixed-use office, retail, and residential land uses, coinciding with the extension of Sound Transit's regional light rail network through the area.

While it is neither necessary nor recommended that all places look and function the same, it is important to recognize that some fundamental characteristics of urban form and site design increase the likelihood that an area will support access to and the operation of transit. The Transit Master Plan "Abundant Access" vision statement aims to provide "efficient, useful, attractive service for the most people, to most destinations, most of the time, serving maximum ridership." Thus, while coverage services will be provided to the extent possible with available resources, when trade-offs are required, places that foster productive service are prioritized. For additional information about the Service-Oriented Strategies and future transit networks proposed by the Transit Master Plan, refer to the *Market-Driven Strategies Report* and *Transit Service Vision Report*.

Figure 27 Population growth in Bellevue, 2010–2030.

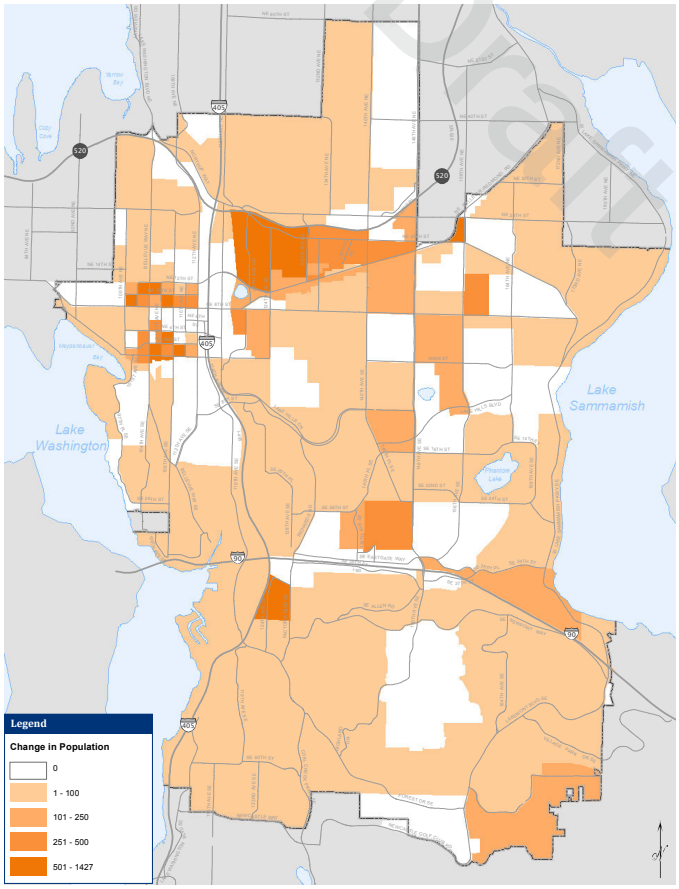


Figure 28 Employment growth in Bellevue, 2010–2030.

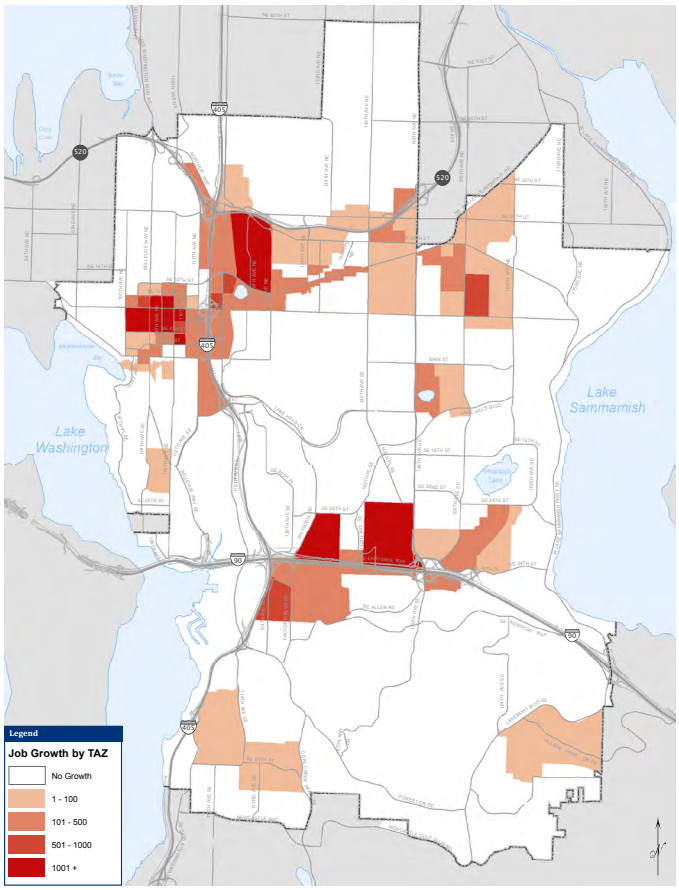


Figure 29 Single-family suburban residential neighborhood.

Figure 30 Auto-oriented retail center and office campuses.

Figure 31 Local retail center and multi-family residential developments.

Figure 32 Downtown core with mixed-use office, regional retail, and high-rise residential developments.

IMAGERY FROM Bing Maps

Draft

"Transit needs to be made easier and faster so that people would make decisions to ride based off of the convenience…. I favor setting up high-ridership corridors for transit that serve high density areas."

- Dallas Evans, *Parks and Community Services Board, TMP Forum*

Looking to the future, between 2010 and 2030 the City of Bellevue as a whole is expected to increase in population by over 28,000. Downtown Bellevue is expected to double in size, reaching 19,000 by 2030, comprising about 45 percent of the city's projected population growth over the next twenty years (see Figure 27). Bel-Red is expected to accommodate about 7,500 in population, almost another third of projected growth, and other mixed use areas about 16 percent. The remaining 7 percent of Bellevue's projected population growth is expected to be spread throughout residential areas in the city as development occurs on remaining vacant and underdeveloped land.

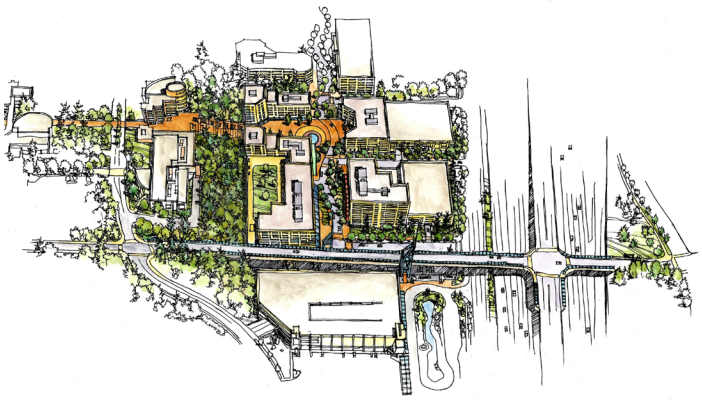
The number of jobs in Bellevue is expected to increase by over 54,000 between 2010 and 2030 (see Figure 28). Downtown Bellevue is projected to capture over half of these jobs, and Bel-Red about 18 percent. Eastgate will capture almost 14 percent,

Figure 33 Transit reinforces the Downtown Bellevue 2030 Vision, Bel-Red Subarea Plan, South Kirkland Park-and-Ride Transit Oriented Development Project, and Eastgate/I-90 Transit Oriented Development concept.

Downtown Bellevue 2030 Vision

South Kirkland Park-and-Ride TOD Project

Bel-Red Subarea Plan



Eastgate Transit Oriented Development Concept

and SR-520 nearly 5 percent. Other commercial and industrial lands in the city will capture the remaining 12 percent of projected job growth. Focusing growth and development around these major transit stops allows more people to live near transit services, and makes more destinations accessible by transit.

To support this growth, it will be critical to integrate the provision of enhanced transit supply with a supportive land use mix, together with enhanced transit passenger and walking amenities, as well as transit supportive infrastructure. There are a number of promising trends that suggest the continued improvement of transit as a viable mobility option for Bellevue residents (see Figure 33).

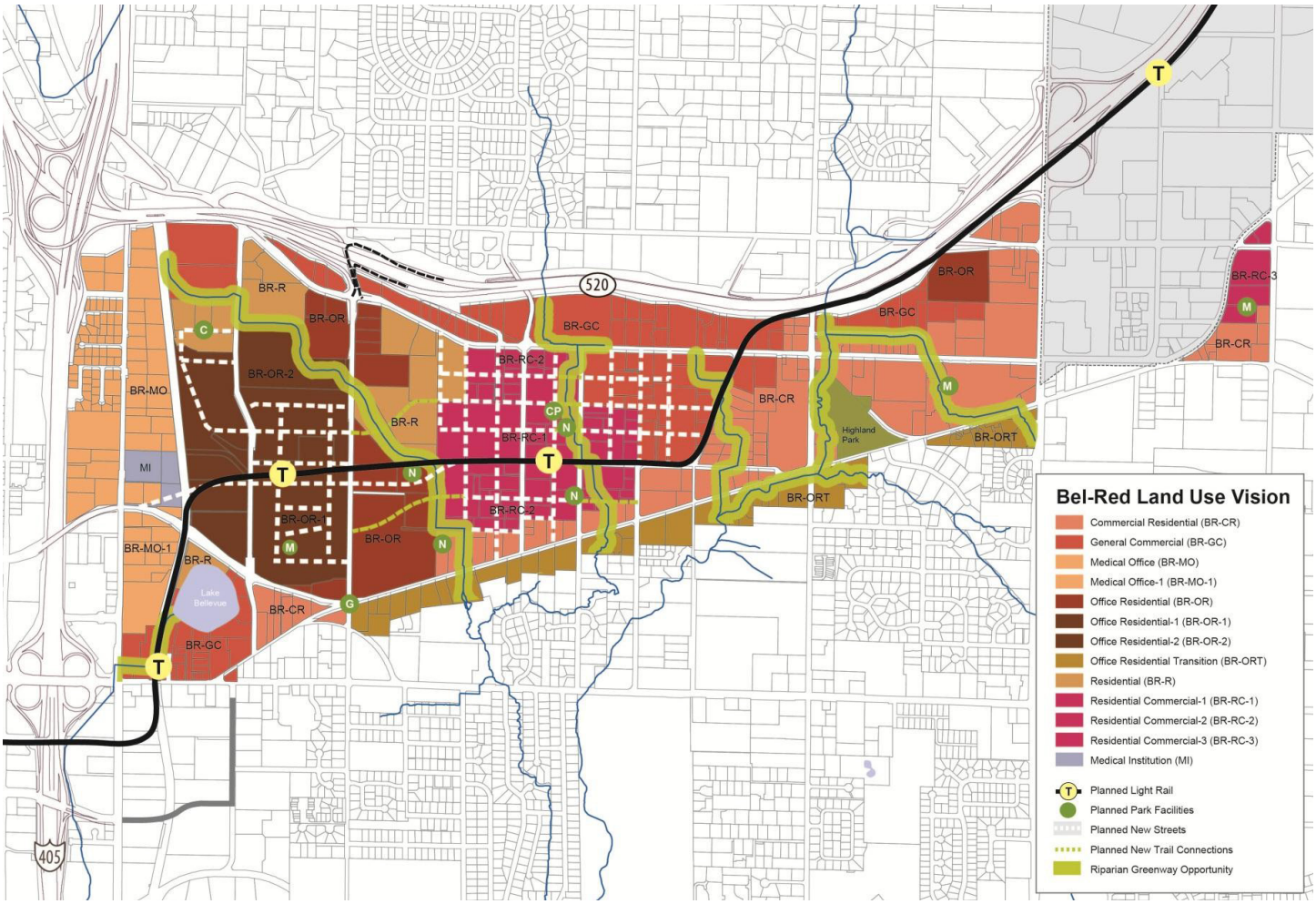
One of the objectives of Bellevue's growth strategy is to strategically allocate population and employment in locations that are or are intended to be rich in public amenities, including public transit.

Draft

"Rezoning a corridor to encourage mixed-use development, creating a comprehensive plan for the area, actively reaching out to investors, marketing the program, offering financial incentives — these elements of a strong official involvement directly predicted TOD success."

- Eric Jaffe, *The Surprising Key to Making Transit-Oriented Development Work* (2013)

Figure 34 Bel-Red Land Use Vision with the future local street system grid.



Draft

Policies from the Comprehensive Plan

Transportation and Urban Design Elements

TR-8: Incorporate transit-supportive and pedestrian-friendly design features in new development through the development review process.

TR-61: Work with transit providers to maintain and expand direct and frequent regional bus routes to support the city's land use and mode split goals.

TR-70: Promote transit use and achieve land use objectives through transit system planning that includes consideration of: 1) Land uses that support transit, including mixed use and night-time activities…

UD-48: Encourage site and building designs that support and connect with existing or planned transit facilities in the vicinity.

While many areas of Bellevue are expected to see some growth in the future, those growing the fastest are concentrated in select areas. The biggest clusters of growth are in Downtown Bellevue, along the proposed alignment of East Link through the Bel-Red Corridor, in Factoria, and in the vicinity of Bellevue College. These are all areas where transit can effectively serve a large population and function as a catalyst for transit-oriented development. Future transit service increases, whether through new routes or frequency improvements, should be successful when concentrated in these areas.

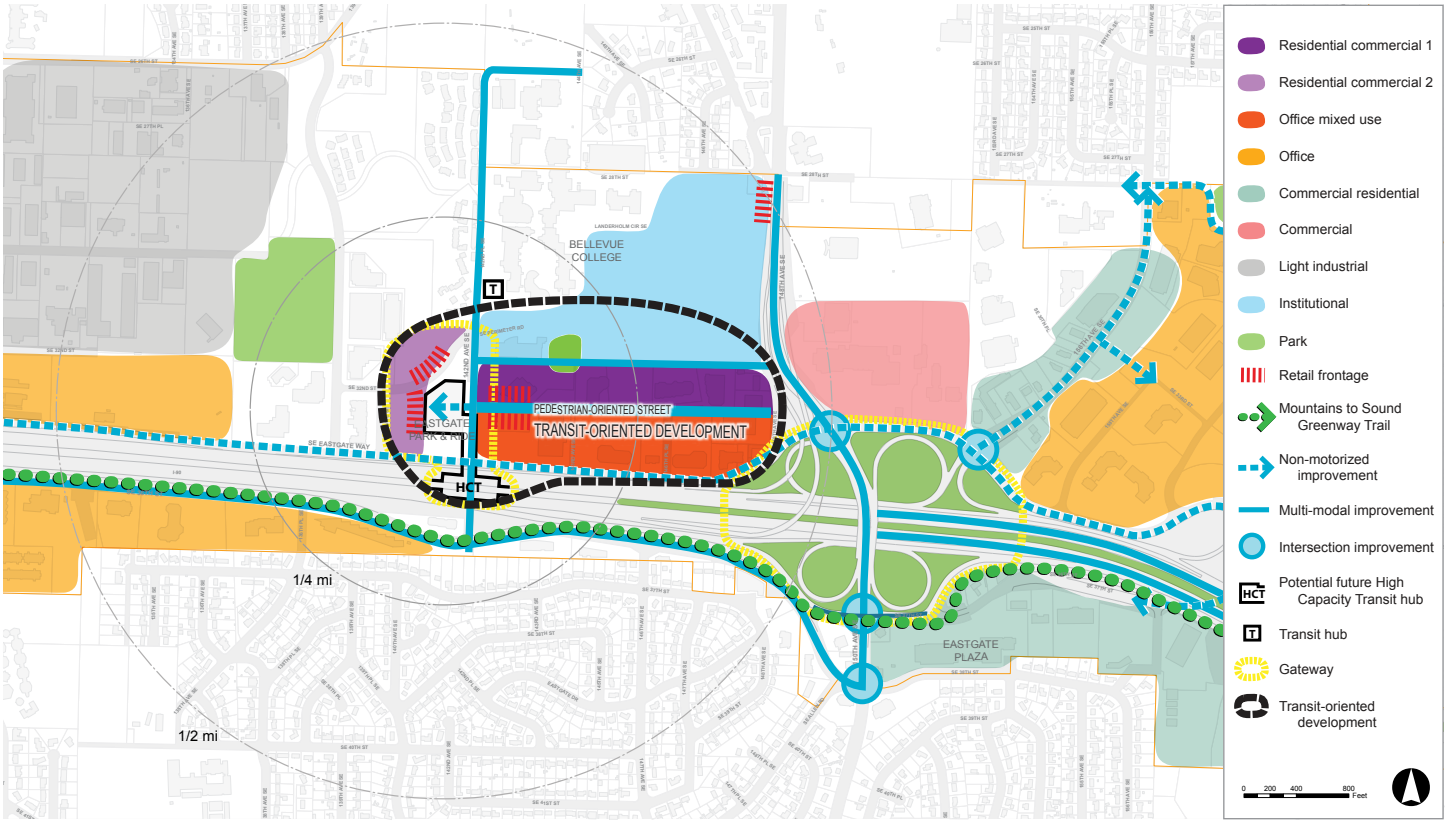
Bellevue's Comprehensive Plan acknowledges that responding to anticipated growth in travel necessitates a multi-modal transportation solution that offers the public real choices about how they travel within, to, and through Bellevue. Several examples of Comprehensive Plan policies addressing the relationship between land use and transit are shown at left; a more comprehensive list is provided in Appendix A on page A183.

The Bellevue City Council views transit solutions as an increasingly important part of the local and regional transportation system—as reflected in the City's overall goal for the Transportation Element of its Comprehensive Plan:

> *To maintain and enhance mobility for residents and businesses through the creation and maintenance of a balanced system of transportation alternatives that:*
>
> - *Provides a wide range of travel choices;*
> - *Supports the land use vision of the city;*
> - *Protects our neighborhoods from adverse transportation impacts;*
> - *Reflects the regional role of the city in transportation issues; and*
> - *Reduces the overall dependency on automobiles throughout the city.*

The Bellevue Transit Master Plan aims to support the City's growth strategy with a Frequent Transit Network by: (i) directing service where there is anticipated to be high ridership, typically where there is some mix of higher residential or commercial density, major activity centers, and measures that discourage driving; (ii) building and supporting park and ride facilities that help people access the transit system; (iii) improving the way people make transit connections so they can reach more destinations in less time; (iv) investing in speed and reliability enhancements such as transit priority measures and bus rapid transit.

Figure 35 The Bellevue College Connection Multimodal Transportation Corridor (Project L27) will contribute to the integration of a balanced transportation system that emphasizes transit and non-motorized connectivity with Bellevue College and a cluster of mixed-use residential, retail, and office buildings around a new pedestrian-friendly "main street" envisioned east of the park-and-ride, creating a vibrant urban neighborhood where people can live, work, shop, learn, and recreate. The map below is an excerpt from the Eastgate/I-90 Land Use and Transportation Report.



Draft

This page intentionally left blank.

Draft

SECTION 2:

THE PEDESTRIAN AND BICYCLE ENVIRONMENT

Draft

WHY ACCESS MATTERS:

Increased ridership and revenue. Safe, effective and convenient access to transit stops maximizes ridership and revenue. Barriers that prevent, or conditions that discourage, a potential customer from accessing a transit stop depress transit ridership.

More efficient fixed-route transit service. Access deficiencies may cause bus routes to deviate or to take an indirect path to serve hard-to-access destinations like office complexes surrounded by surface parking, or medical complexes with multiple entrances. The more direct a transit route is, the less running time and potentially cost is required to provide a given level of service. Also, more direct service can be more competitive with the auto and attract more customers and revenue.

Increased opportunity for pedestrian travel for any trip. All transit customers are pedestrians for some part of the trip. This includes the walk from one's origin to the stop, transfers between an auto and transit vehicle and transferring between two transit vehicles. Improved access to transit leads to improved conditions for other walking trips.

More balanced transportation modes. Application of the standards presented in this Recommended Practice will have benefits for pedestrian trips of all kinds, not just those to access transit. Access solutions such as off-street paths may benefit cycling trips as well as walking and access to transit. Even auto trips may benefit if increased connectivity results in more direct trips. In many communities, auto access may trump access by other modes. As communities prepare for environmental, resource and economic challenges of the future, a more balanced transportation system my help them adapt.

Source: APTA, *Design of On-street Transit Stops and Access from Surrounding Areas* (2012: iii)

BACKGROUND

The terms 'access' and 'accessibility' can be defined in several different ways, depending on context. For example, in the context of the Americans with Disabilities Act of 1990 (ADA), accessible facilities are those that meet certain design requirements to ensure that individuals with mobility, vision, and hearing impairments are able to fully enjoy public accommodations. For the purposes of this report, access is considered more broadly as simply the ability to reach one's desired destinations; the destinations being considered are transit stops in the 2030 Frequent Transit Network (FTN), and the means of travel to these stops are on foot and by bicycle.

All transit users are pedestrians for some part of their trip. For this reason, the provision of an accessible pedestrian network is an essential component of a useful transit system. If potential transit users are unable to reach a bus stop easily, quickly, and reasonably directly, they are more likely to consider alternative travel modes if any are available to them.

The purpose of this analysis is to determine which existing pedestrian and bicycle projects proposed by other planning efforts would specifically improve non-motorized access to transit. Unlike the 'Transit Running Way' section of this report, this section does not propose any new projects, nor does the basic assessment presented here assign any priority ranking (e.g. high/medium/low) to a project for which this has not already been done. This represents only a first-level of screening for identifying pedestrian and bicycle projects that should be considered a priority from the perspective of transit. A more rigorous analysis, briefly previewed at the end of this section, will leverage more complex accessibility metrics to propose a means of prioritizing non-motorized projects based on the degree to which they improve one's ability to access transit.

Community Input

The characterization of pedestrian and bicycle access to transit as an important consideration for transit planning is supported by results obtained by the *Bellevue Transit Improvement Survey* conducted in early 2012. When asked how the City should invest municipal resources to improve transit, 5 percent of current transit users supported installation of additional bicycle facilities to better connect neighborhoods to bus services, and 2 percent supported improvements to sidewalk connectivity at and around bus stops. Although this is not current transit users' highest priority, at a combined 7 percent, access network improvements remain a notable concern (see Figure 36).

"The ability for patrons of transit agencies to get to and from, or access, transit stops is critical for providing a safe, pleasant and convenient trip from beginning to end. Improvements to the ways in which patrons access stops can yield higher ridership and greater patron satisfaction."

- APTA, *Design of On-street Transit Stops and Access from Surrounding Areas* (2012: iii)

Draft

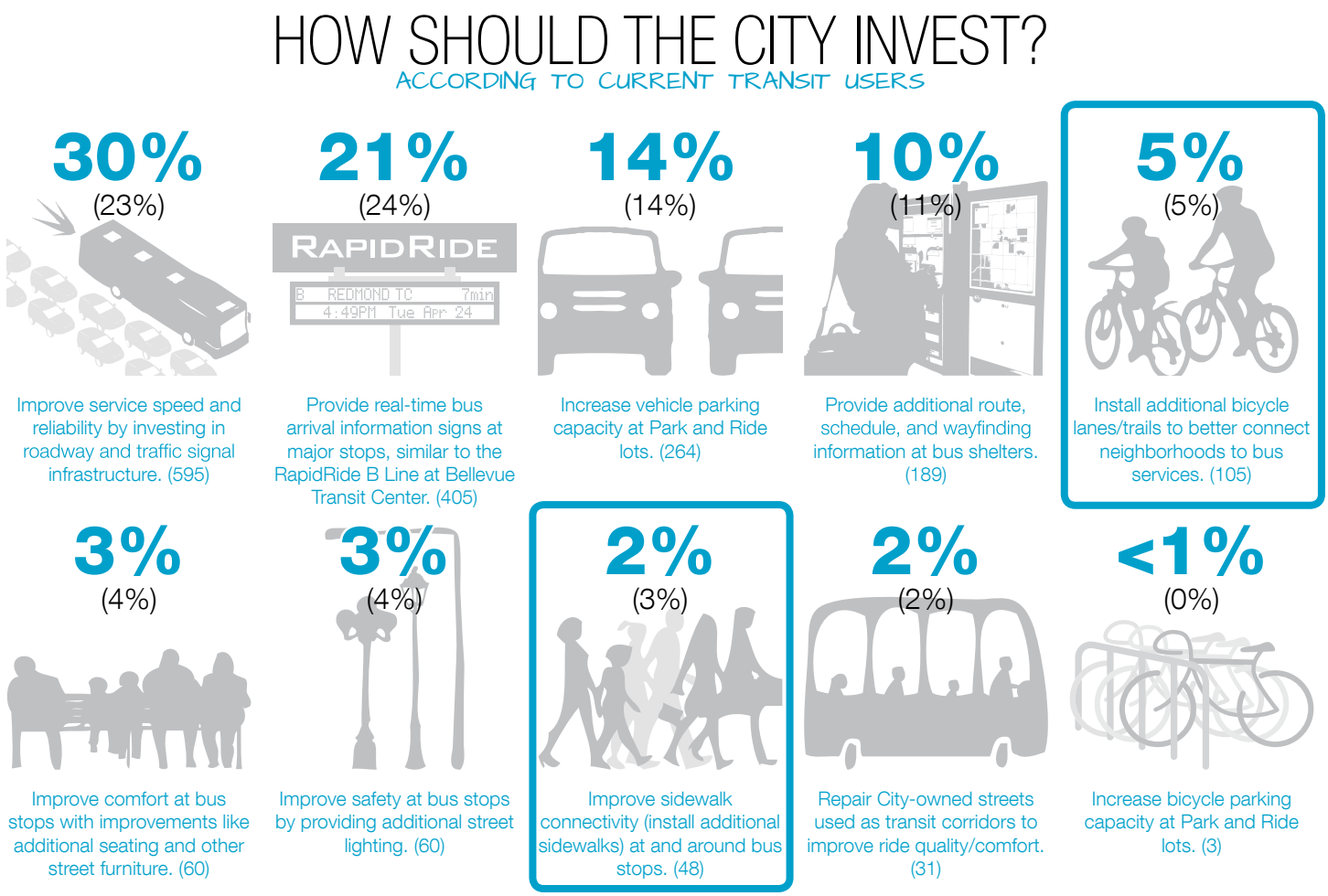


Figure 36 Priorities for municipal investment in transit among those who currently use transit services in Bellevue, according to the Bellevue Transit Improvement Survey. Large blue percentages reflect all current transit users, small black percentages in parentheses reflect all current transit users who reside in Bellevue, and small blue numbers in parentheses following each description reflect the total number of respondents.

Draft

"Failure to provide adequate access means that some people will be denied opportunities for leisure, employment, trading, healthcare, education – even for taking part in the electoral process. Accessibility is not just about being 'nice' to people with difficulties, it is about ensuring that the benefits and responsibilities of living in society are truly available to, and are shared between, the vast majority of its members."

- Nick Tyler, *Accessibility and the Bus System: From Concepts to Practice* (2002: 2)

Perhaps more tellingly, when those who have never used transit in Bellevue were asked what improvements would make them consider riding the bus, 46 percent selected the proximity of stops to their home/destinations, and 8 percent selected improved pedestrian connections to bus stops (see Figure 37). The *Transit Service Vision Report* has already defined its intentions for Bellevue's future transit networks through 2030—though stop-level recommendations were not proposed (see page 58 for details)—so the absolute proximity of stops to properties in Bellevue has generally been established. However, the perceived distance between properties and bus stops can be significantly affected by the pedestrian and bicycle facilities that are available to connect those properties to their nearest stop. Many situations exist citywide where a well-located non-motorized facility could dramatically reduce the walking or bicycling distance from a given property to its nearest transit stop.

WHAT IMPROVEMENTS WOULD GET YOU TO CONSIDER RIDING THE BUS?

ACCORDING TO THOSE WHO HAVE NEVER USED TRANSIT IN BELLEVUE

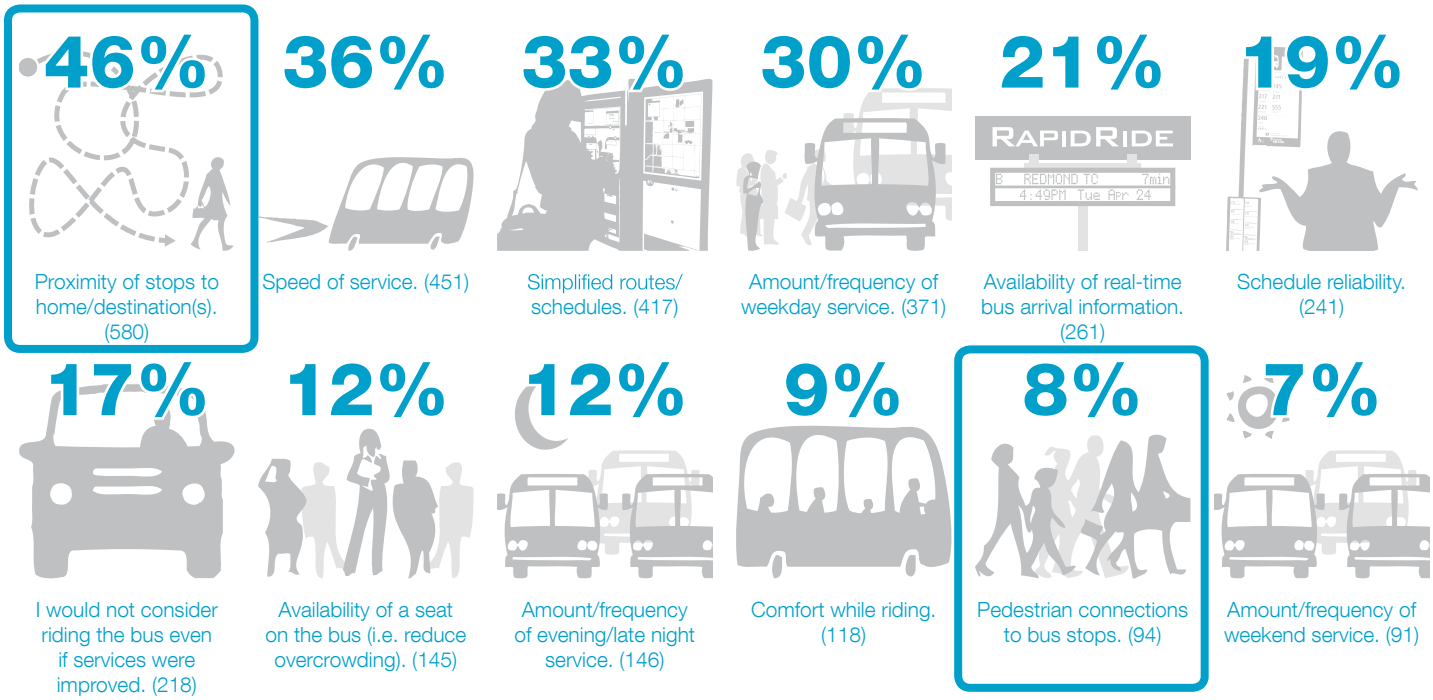


Figure 37 Factors that would encourage those who have never used transit services in Bellevue to consider doing so, according to the Bellevue Transit Improvement Survey. Large blue percentages reflect all self-identified transit non-users; small blue numbers in parentheses following each description reflect the total number of respondents.

Comprehensive Plan Policies

Given these stated preferences from members of the community, it is clear that facilitating non-motorized access should be of interest to the City, and indeed there are several policies in the Comprehensive Plan that directly address this issue. The list at right provides a representative sample of some of the policies most directly relevant to pedestrian and bicycle access to transit. Refer to Appendix A on page A183 for a more comprehensive list of all policies related to non-motorized access to transit.

Abundant Access Vision

The Transit Master Plan has also defined strategies that relate specifically to the subject of access to transit. When the "Abundant Access" vision statement was established during the Service Element planning process, one of the six Service-Oriented Strategies specifically addressed this issue, as does one of the four Capital-Oriented Strategies. Both the service and capital components of the "Abundant Access" vision are presented on the following pages, with excerpts of the relevant text providing additional context for the language used to define the strategy.

Draft

Policies from the Comprehensive Plan
Transportation and Urban Design Elements

TR-77: Consider pedestrians and bicycles along with other travel modes in all aspects of developing the transportation system.

TR-79: Assign high priority to pedestrian and bicycle projects that… [p]rovide accessible linkages to the transit and school bus systems.

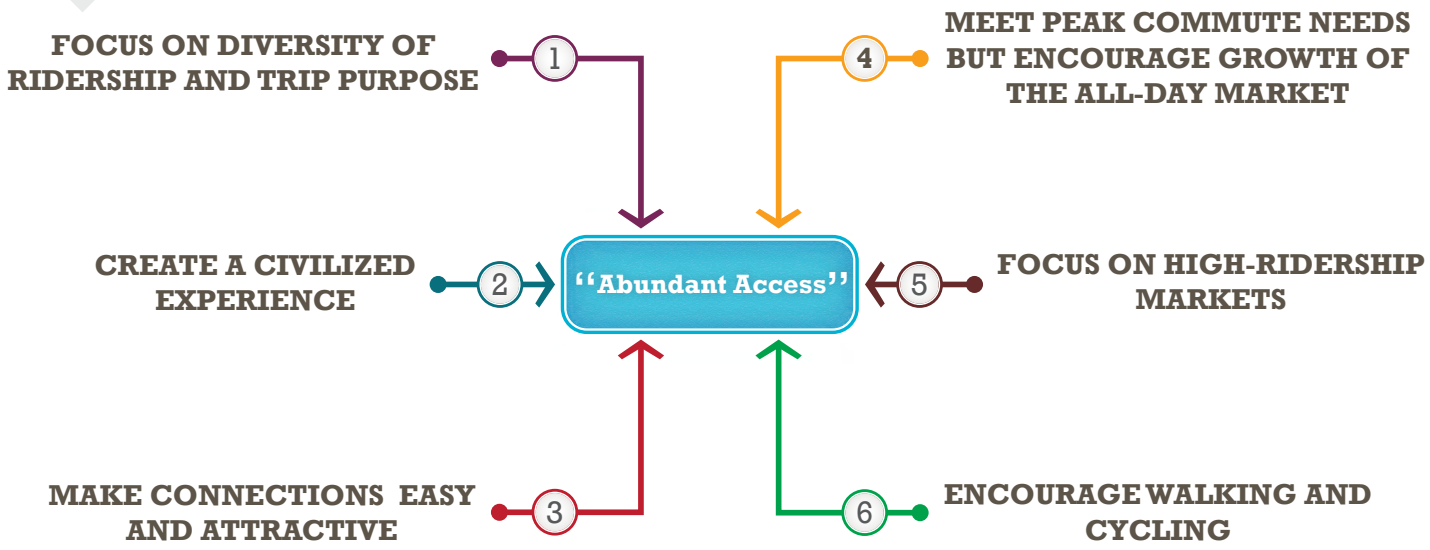
TR-56: Develop partnerships with transit providers to implement projects providing neighborhood–to–transit links that improve pedestrian and bicycle access to transit services and facilities.

TR-80: Encourage transit use by improving pedestrian and bicycle linkages to existing and future transit and school bus systems, and by improving the security and utility of park-and-ride lots and bus stops.

UD-49: Design and coordinate the proximity of bike racks, wheelchair access, pedestrian amenities, and other modes of transportation with transit facilities.

Draft

Figure 38 Six Service-Oriented Strategies comprise the "Abundant Access" vision.



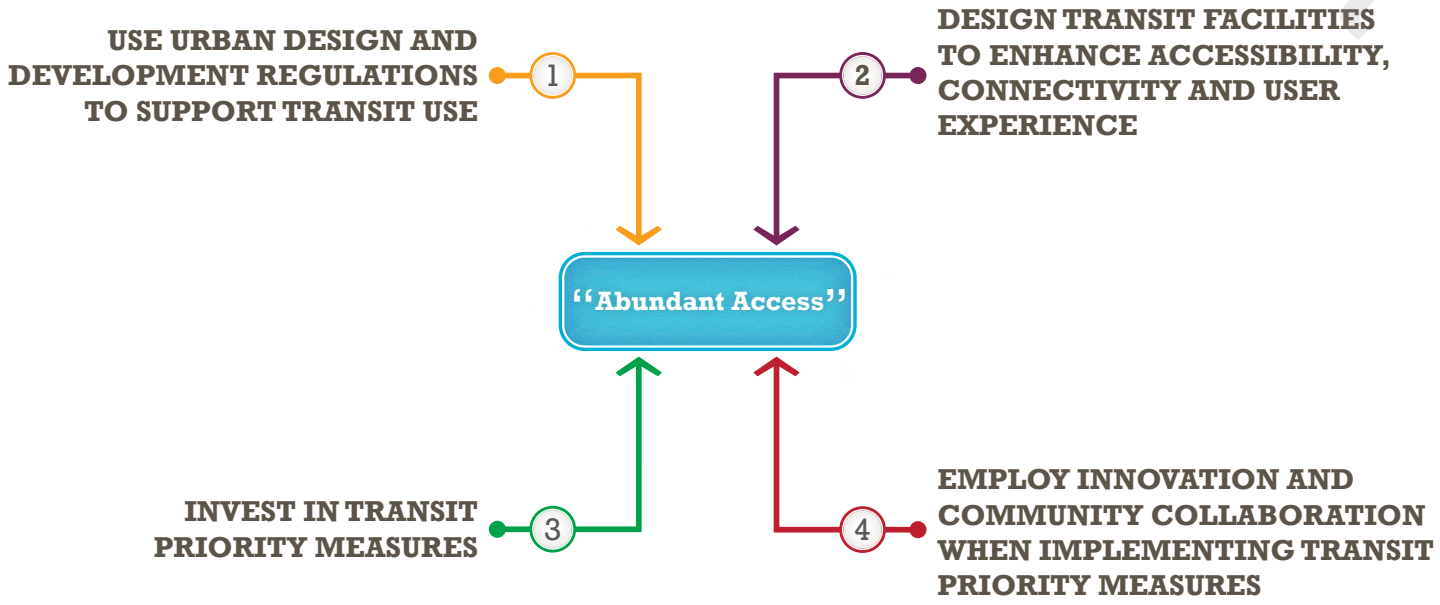
6 Service-Oriented Strategy
ENCOURAGE WALKING AND CYCLING

As the transit network moves towards attracting more patrons who take transit by choice, it will be increasingly important to factor in the pedestrian and bicycle experience as part of a more holistic ridership strategy so that transit can run more efficiently.

The efficiency of the transit network is compromised when bus routes try to get too close to everyone's home — no matter how winding the road network or dispersed the land use patterns. Integrating pedestrian and bicycle use with transit service is an effective means of attracting new riders by increasing the catchment areas of stations and stops without expensive investments in route expansion or new routes. Since transit cannot provide universal door-to-door access, ensuring that stops are easily accessible to a large percentage of the public is important to enhancing ridership. Walking and cycling are already the predominant methods by which people access transit; today only 16 percent of transit customers access public transportation at Park-and-Ride facilities in Bellevue. Transit's role is not to compete with walking or cycling, but rather to compete with cars, so it must focus on faster services that are worth walking or cycling to.

Draft

Figure 39 Four Capital-Oriented Strategies comprise the "Abundant Access" vision.



Capital-Oriented Strategy

2 DESIGN TRANSIT FACILITIES TO ENHANCE ACCESSIBILITY, CONNECTIVITY, AND USER EXPERIENCE

The location and design of transit stops, centers, and park & ride facilities is an important factor in determining how far pedestrians, cyclists, and drivers must travel to reach transit services and the quality of the wait once they get there. These facilities are the most consistently visible image of a city's transit system.

When stops, transit centers, and park & ride facilities are poorly designed, difficult to reach, or uncomfortable for users, it can negatively affect the image of a transit system and reduce opportunities for capturing choice ridership. When local governments partner with transit agencies—as is the case with work underway at the South Kirkland Park & Ride, a transit oriented development project that integrates housing within a transit hub—the transit facility environment will enhance connectivity between different modes of transportation and contribute to a positive community identity.

Draft

PEDESTRIAN AND BICYCLE ACCESS IMPROVEMENT PROJECTS

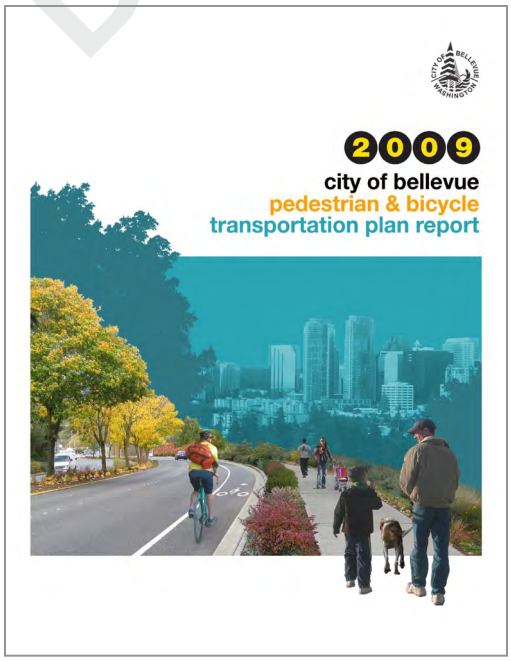


Figure 40 The *2009 Pedestrian and Bicycle Transportation Plan Report* is the principle reference for planning, designing, constructing, and maintaining pedestrian and bicycle facilities in Bellevue. See

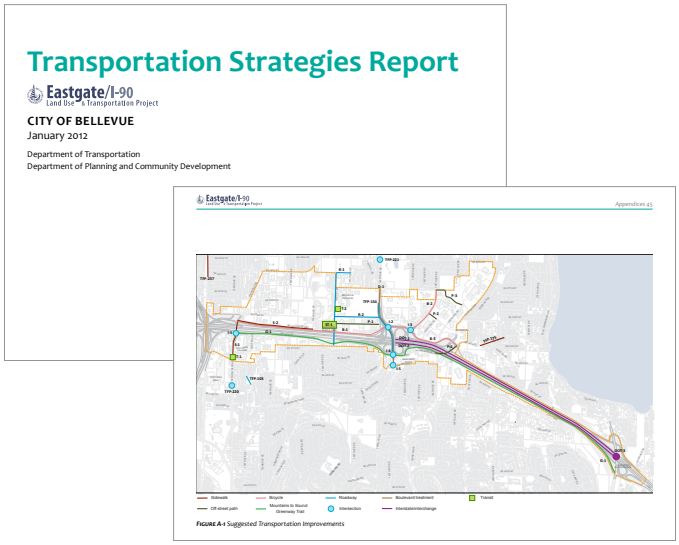


Figure 41 Additional projects considered include those included in the *Eastgate/I-90 Transportation Strategies Report*, adopted by City Council in April 2012.

The projects included in this analysis are all derived from two existing plans: the *2009 Pedestrian and Bicycle Transportation Plan Report* (hereafter referred to as the 2009 Ped-Bike Plan), and the *Eastgate/I-90 Transportation Strategies Report*. Nearly all of the projects included in the final list come from the former, with the latter plan adding only a few projects. The 2009 Ped-Bike Plan includes a total of 504 projects, of which 237 are sidewalk projects, 167 are bicycle projects, 46 are offstreet path projects, 53 are trail projects, and 1 (not included in this analysis) is an education program. Figure 42 depicts the categories of projects included in the 2009 Ped-Bike Plan.

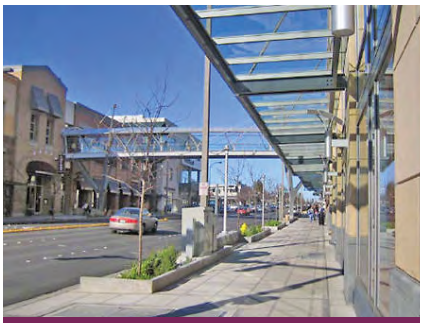
Of the seventeen projects in the Eastgate/I-90 Plan that include non-motorized improvements, seven are not already reflected by projects in the 2009 Ped-Bike Plan. These include one each of sidewalk, offstreet path, and trail projects, and four multimodal intersection improvement projects. Figure 44 on page 46 provides a map of all 511 of these projects.

Although, as noted, the Capital Vision does not propose any new pedestrian or bicycle projects, one of the running way improvement projects (L27: Bellevue College Connection) is a multimodal corridor that includes non-motorized components. The 2009 Ped-Bike Plan already includes two projects along the same rights-of-way, so the descriptions of those two projects are revised to reflect the proposal being advanced by the Transit Master Plan, as described in Appendix B1 on page A187.

Draft

Figure 42 Existing non-motorized transportation facility types, as identified by the *2009 Pedestrian and Bicycle Transportation Plan Report.*

SIDEWALKS



12 ft. walk and 4 ft. planter

8 ft. walk and 4 ft. planter

6 ft. walk and 4 ft. planter

5 ft. walk without planter

BICYCLE & OFFSTREET PATHS

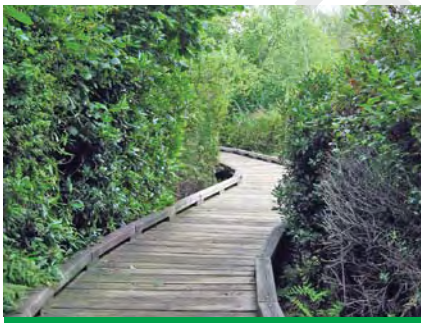
Off-Street Path

Bike Lane

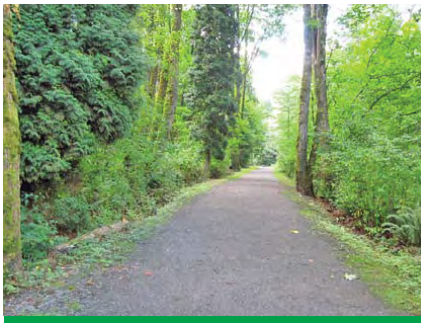
Bike Shoulder

Wide Outside Lane

TRAILS

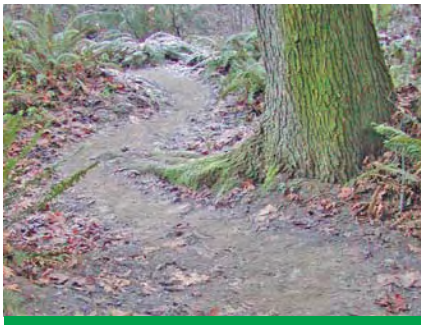


Boardwalk



Multi-Use Gravel Trail

Walking Trail



Primitive Hiking Trail

Draft

"[B]us systems—as with any public transport system—involve the superimposition of two networks: the access network used by people to reach the system and the bus network provided by bus operators as a response to their perception of users' needs. The connecting points between these two networks are formed by bus stops..."

-Nick Tyler, *Accessibility and the Bus System: From Concepts to Practice* (2002: 2)

Ped-Bike Project Prioritization

The 2009 Ped-Bike Plan assigned one of three priority designations—high, medium, or low—to each project included in that plan, with ranks assigned according to the criteria reproduced in Table 7 below. It should be noted that quarter-mile proximity to and stop-level ridership at a bus stop is among the corridor conditions contributing to a project's priority ranking. However, transit considerations were only one part of the overall prioritization scheme used in the 2009 Ped-Bike Plan, as the emphasis of that plan was not on transit. For the purposes of this preliminary screening of transit priority pedestrian and bicycle projects, these priority rankings are considered and reported, but the more rigorous access analysis underway will assign new, transit-centric priority rankings according to other metrics. The Eastgate/I-90 Plan did not assign priority rankings to any of the projects proposed therein.

Table 7 2009 Pedestrian-Bicycle Transportation Plan GIS-Based Project Prioritization Framework.

Category	Indicator	Points
Corridor Conditions	System linkage (connectivity to other sidewalk/bikeway facilities)	20
	Severity of problem (how many collisions have occurred)	10
	Roadway arterial classification	10
	Bus stop-level ridership (1/4 mile proximity)	10
Social Justice	Vehicle ownership (%)	5
	Below poverty level (%)	5
	Under 18 or 65 and over (%)	5
Destination Network	Park proximity (%)	5
	School proximity (%)	5
	Community center/social service/library proximity (%)	5
	Retail proximity (%)	5
	Major employment center (Comprehensive Plan)	5
	Housing density (Comprehensive Land Use Plan)	10

Transit Priority Ped-Bike Projects

Draft

As noted on the opposite page, the bus stop is the point of connection between the two networks that comprise the bus system—the access and transit networks. As such, when assessing which pedestrian and bicycle projects should be prioritized from the perspective of transit, the projects of interest are those that are proximate to bus stops. For the purposes of this preliminary screening, any project that has some portion within one quarter-mile of an FTN bus stop was selected and identified as being a priority to transit. Figure 43 depicts the Frequent Transit Network, its major stations, the stops assumed to be served for the purposes of this analysis, and the consolidated quarter-mile radial area around those stops.

Figure 45 on page 47 depicts the 342 non-motorized projects that have some portion within one-quarter mile of an FTN stop. That map retains the consolidated quarter-mile radial area for reference but removes FTN route lines so that lines corresponding to non-motorized projects can be identified more easily. Table 8 below summarizes the number of projects of each type and priority ranking (if applicable) identified as a transit priority pedestrian-bicycle project. The full list of identified projects is documented by project type in Appendix B1, Appendix Tables 1 through 5.

Figure 43 Freqeunt Transit Network (FTN) with quarter-mile radial areas around stops.

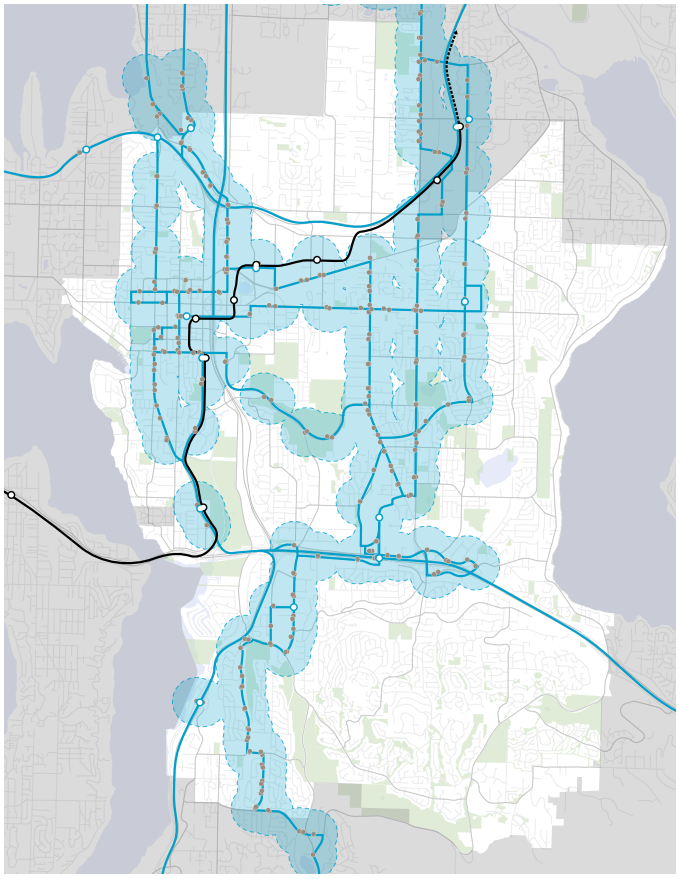


Table 8 Preliminary transit priority pedestrian and bicycle projects.

Project Type	2009 Pedestrian-Bicycle Plan Project Priority						Eastgate/I-90		Total Transit Priority Projects	
	High		Medium		Low		N/A*			
Sidewalk Projects	89	57.8%	50	32.5%	14	9.1%	1	0.6%	**154**	**45.0%**
Bicycle Projects	48	40.7%	39	33.1%	31	26.3%	0	0.0%	**118**	**34.5%**
Offstreet Path Projects	11	29.7%	13	35.1%	12	32.4%	1	2.7%	**37**	**10.8%**
Trail Projects	18	62.1%	7	24.1%	3	10.3%	1	3.4%	**29**	**8.5%**
Multimodal Intersections	0	0.0%	0	0.0%	0	0.0%	4	100.0%	**4**	**1.2%**
All Projects	166	48.5%	109	31.9%	60	17.5%	7	2.0%	**342**	

*Projects from the Eastgate/I-90 Transportation Strategies Report were not prioritized, thus their priority is identified as 'N/A' or 'Not Applicable'.

Figure 44 Citywide pedestrian and bicycle projects identified by other plans.

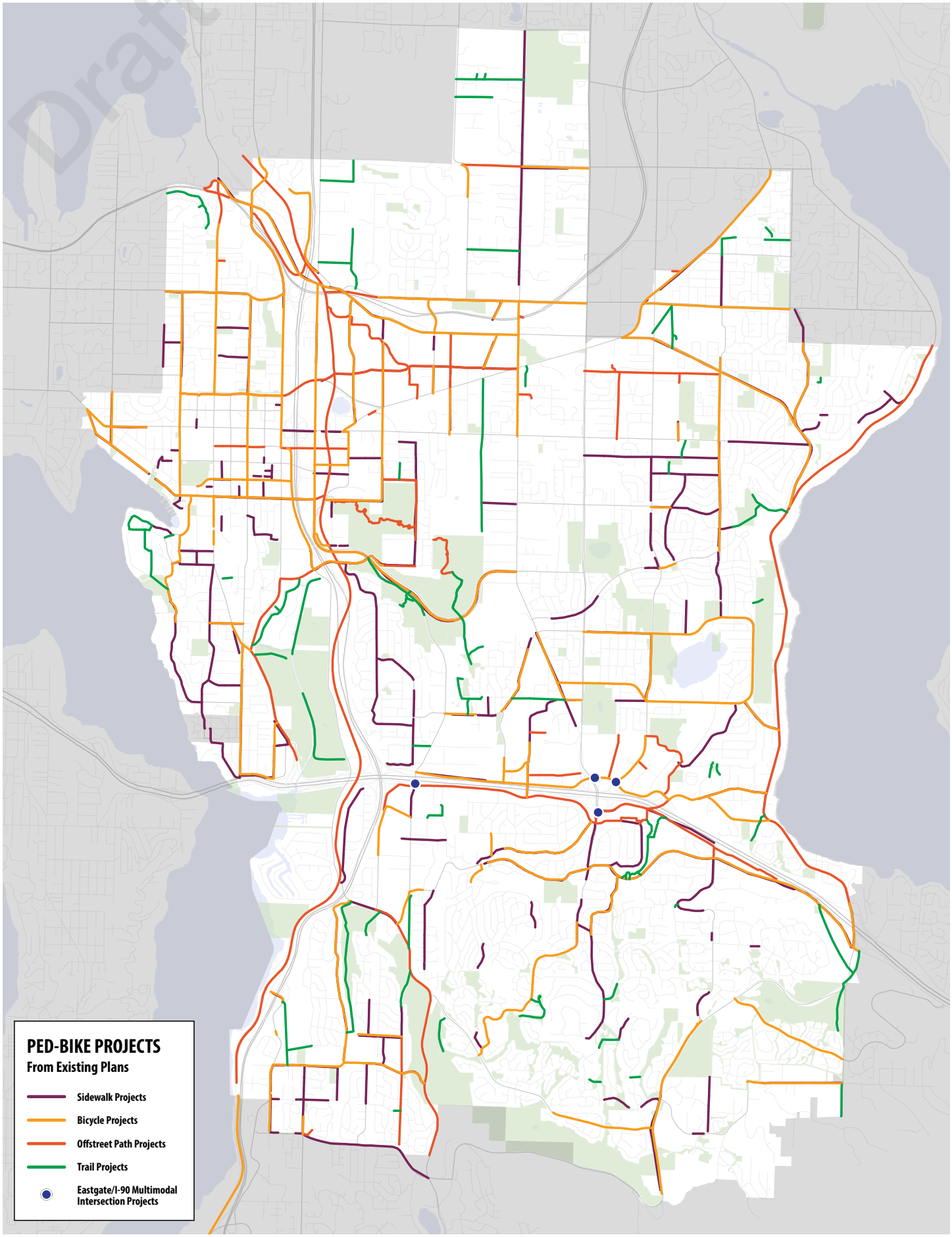


Figure 45 Preliminary transit priority pedestrian and bicycle projects.

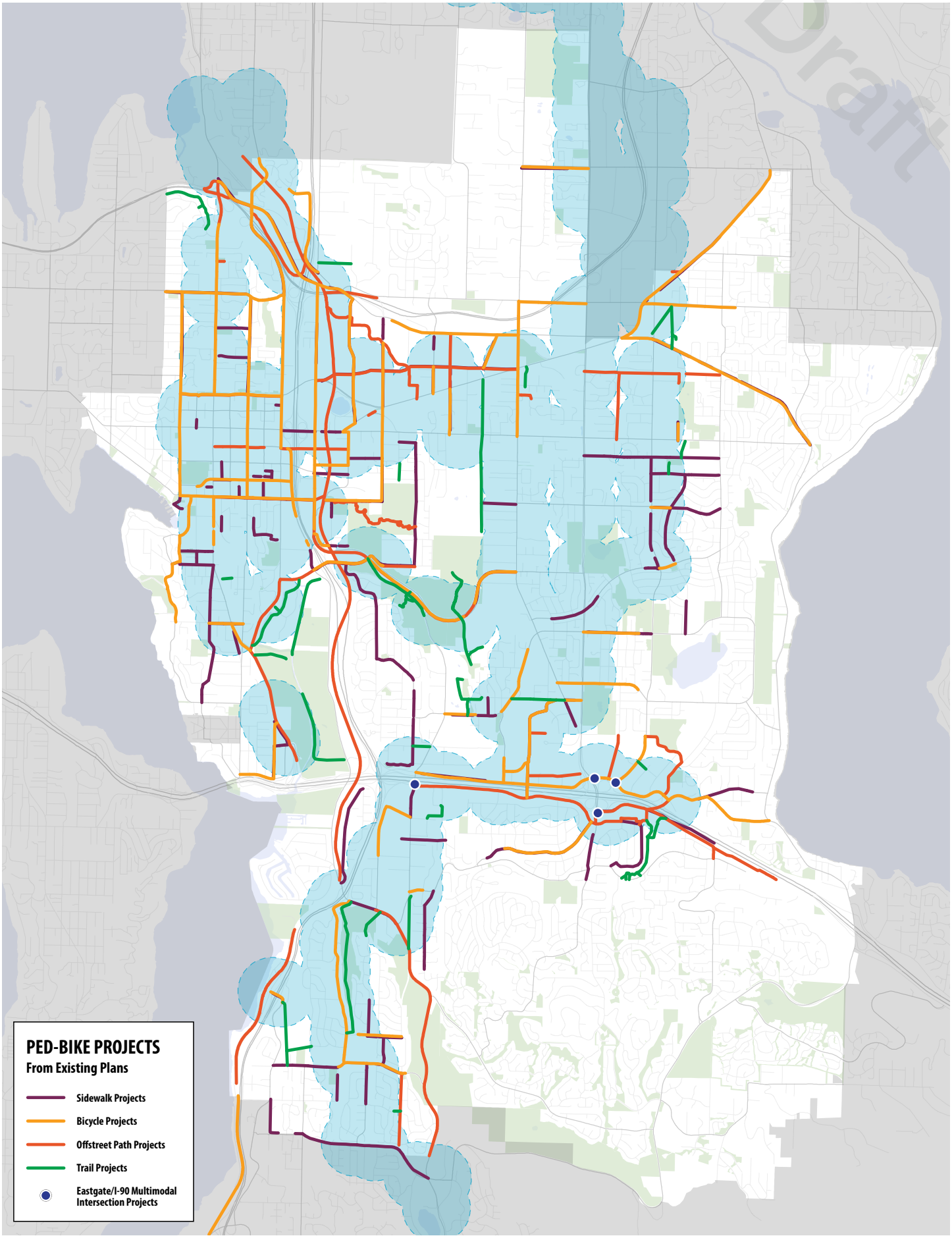


Figure 46 Existing sidewalk, offstreet path, and trail facilities.

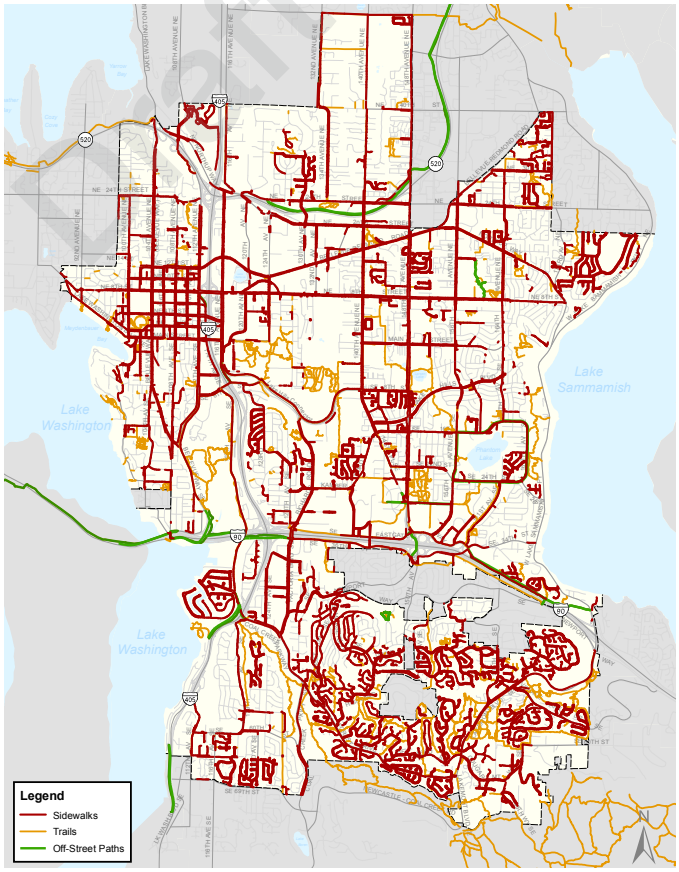
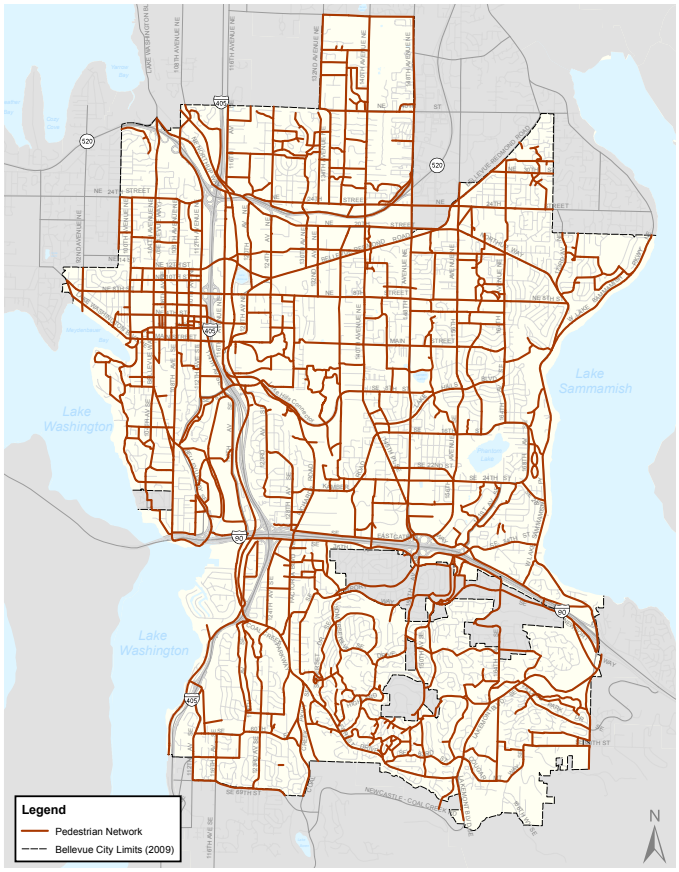


Figure 47 Future pedestrian network map.



Note: Above maps shown as presented in the 2009 Pedestrian and Bicycle Transportation Plan Report.

Sidewalk Projects

As noted in Table 8 on page 45, there are a total of 154 transit-priority sidewalk projects—the largest group, representing 45 percent of the 342 transit-priority non-motorized projects identified. Of those, almost 60 percent (89 projects) were ranked by the 2009 Ped-Bike Plan as being high priority. Figure 48 depicts all 154 projects in relation to the 2030 Frequent Transit Network. Refer to Appendix Table 1 on page A188 for the complete list of transit-priority sidewalk projects.

While these sidewalk projects are generally distributed throughout the city, some areas have a greater density of projects than others. The reasons for this can be gleaned from the FTN network structure and the existing sidewalk (Figure 46) and future pedestrian (Figure 47) network maps. For example, Figure 48 identifies almost no projects in the Somerset and Newcastle neighborhoods, but this is because there is no direct FTN service and an extensive sidewalk network already existing in these areas, so few additional facilities are required to achieve the future pedestrian network there. There are also relatively few in much of Downtown, despite the extensive future network there, because much is already in place.

By contrast, relatively fewer sidewalks exist in, and there are hence more projects identified in East Bellevue just south of Crossroads (S-418, S-419), in Wilburton (S-326, S-327, and S-414), and in Richards Valley (S-338). There are also several sidewalk projects identified in Bel-Red (S-200, S-214, and S-310), which relate to the planned redevelopment of that area from its current character as a manufacturing and warehouse district into a walkable, mixed-use, transit-oriented neighborhood. Several of these sidewalk projects overlap with high priority bicycle and offstreet path projects, including along such corridors as Main St, 120th and 124th Ave NE, SE Lake St, and Lake Hills Connector, among others.

Figure 48 Preliminary transit priority sidewalk projects.

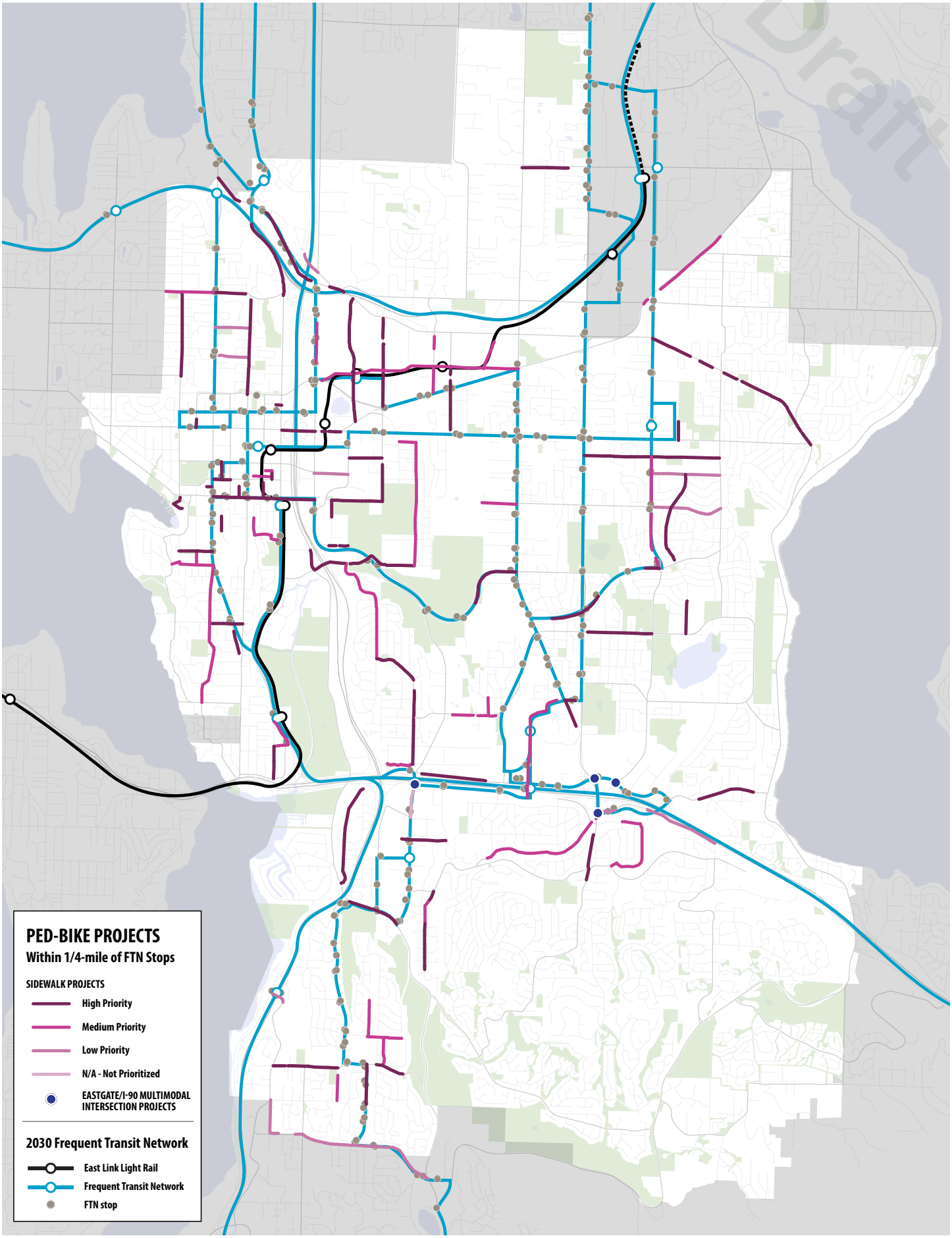


Figure 49 Existing bicycle, offstreet path, and trail facilities.

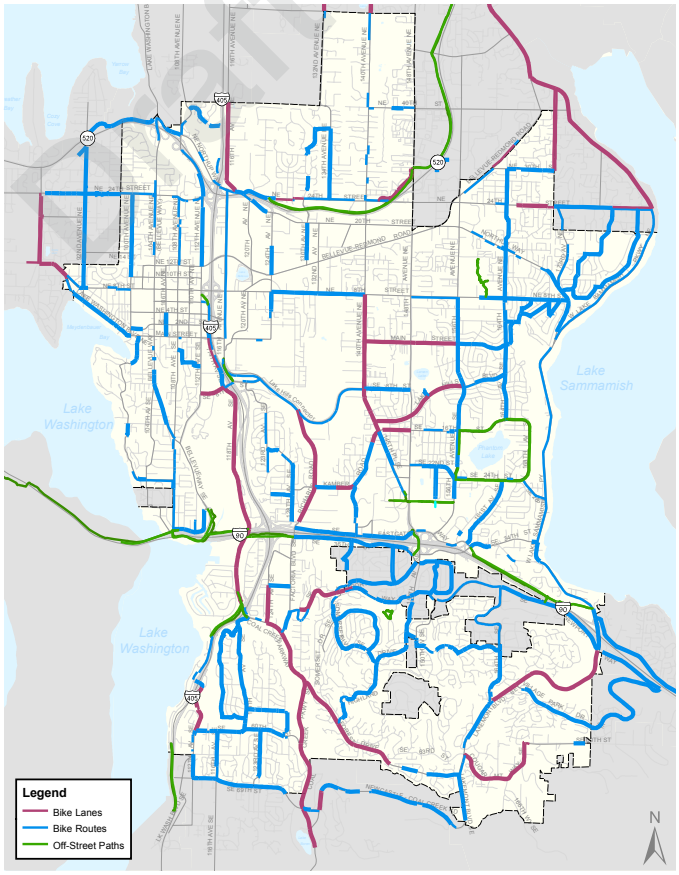
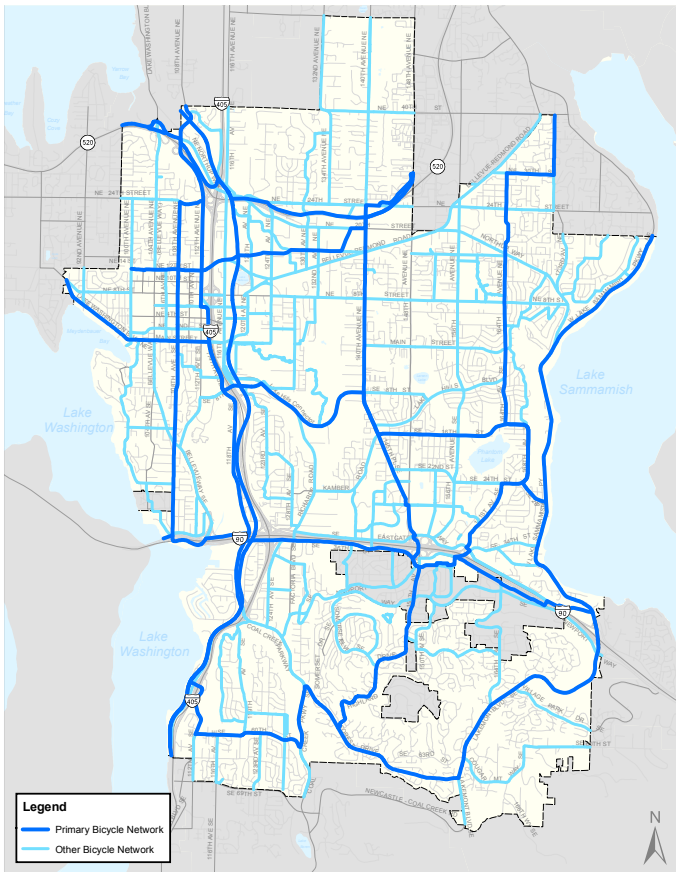


Figure 50 Future bicycle network map.



Note: Above maps shown as presented in the 2009 Pedestrian and Bicycle Transportation Plan Report.

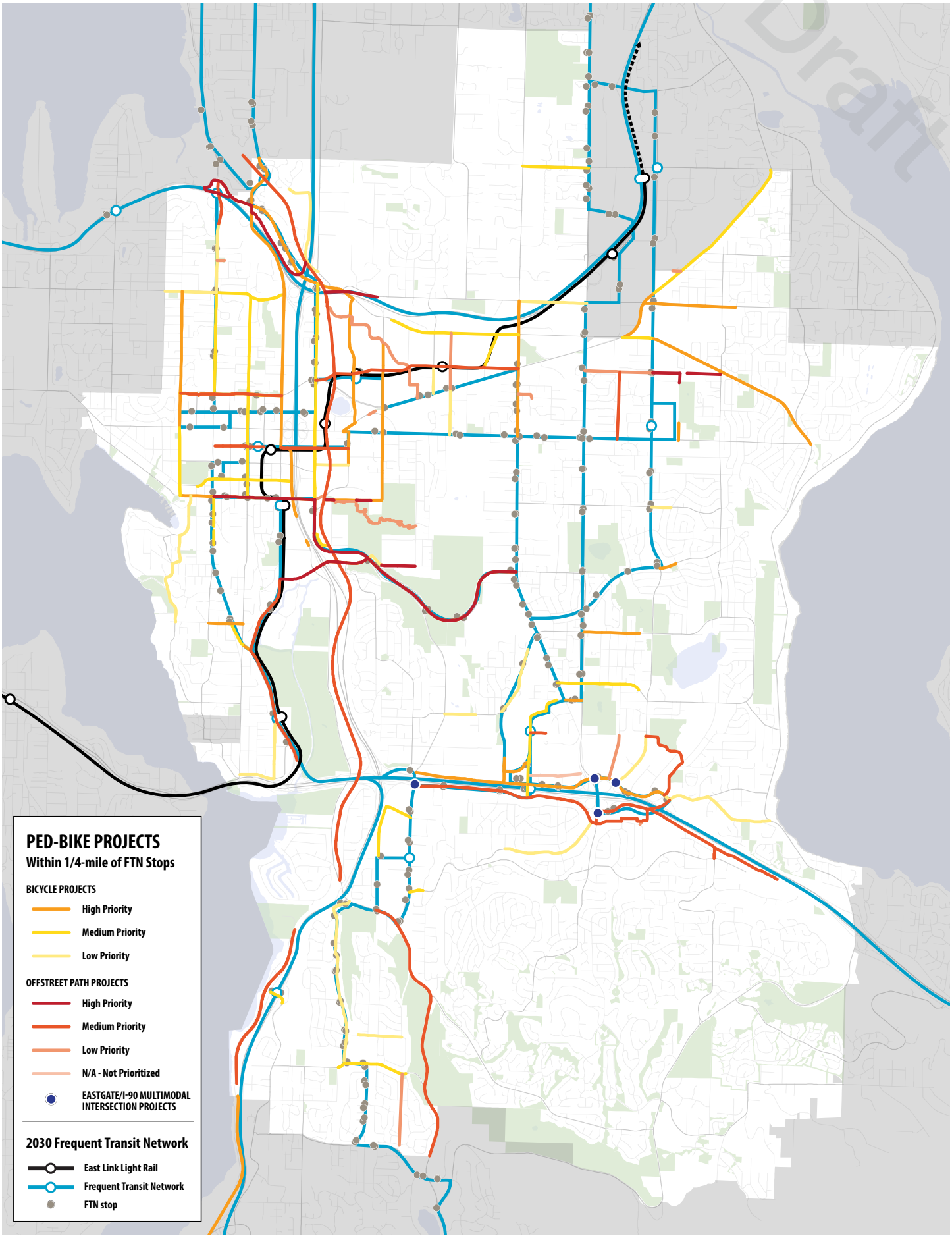
Bicycle and Offstreet Path Projects

There are a total of 118 bicycle and 37 offstreet path projects, representing about 35 percent and 11 percent, respectively, of all transit-priority non-motorized projects. Refer to Appendix Table 2 on page A193 and Appendix Table 3 on page A197 for the complete list of transit-priority bicycle and offstreet path projects.

Bicycle facilities and offstreet paths are somewhat less evenly dispersed throughout the city than sidewalks, with a particular abundance clearly identifiable in and around Downtown and Bel-Red. This is consistent with the more diffuse structure of the future bicycle network (Figure 50), except for the denser grids in these urban centers. Primarily high priority bicycle projects surround Downtown on Main St (B-210 and B-129), 100th Ave NE (B-202), 112th Ave NE (B-104 and B-126), 114th Ave NE (B-127), and NE 12th St (B-118).

One of the most significant offstreet path projects is the *Mountains to Sound Greenway Trail* (O-137), the final design process for which began in 2013. Identified as Priority Bike Corridor FW-4 and already adopted by the Transit Facilities Plan as TFP-243, the project would construct a paved multi-use trail between Factoria Blvd and Lakemont Blvd via SE 36th St and the south frontage of I-90, completing a 3.6 mile gap in the regional facility spanning from the Seattle Waterfront to Central Washington. Together with bicycle project B-146, sidewalk project S-464, and transit running way project L27 (the Bellevue College Connection), project O-137 will significantly improve non-motorized access to the Eastgate Freeway Station and Park-and-Ride. Also related is transit running way project L9, a reconfiguration of the eastbound I-90 off-ramp that may include realignment of the trail. Other high-priority offstreet paths include the three facilities around the SR-520 interchange with Bellevue Way NE (O-100, O-101, and O-103), and a portion of the Lake to Lake Trail (O-123 and O-127).

Figure 51 Preliminary transit priority bicycle and offstreet path projects.



Draft

Trail Projects

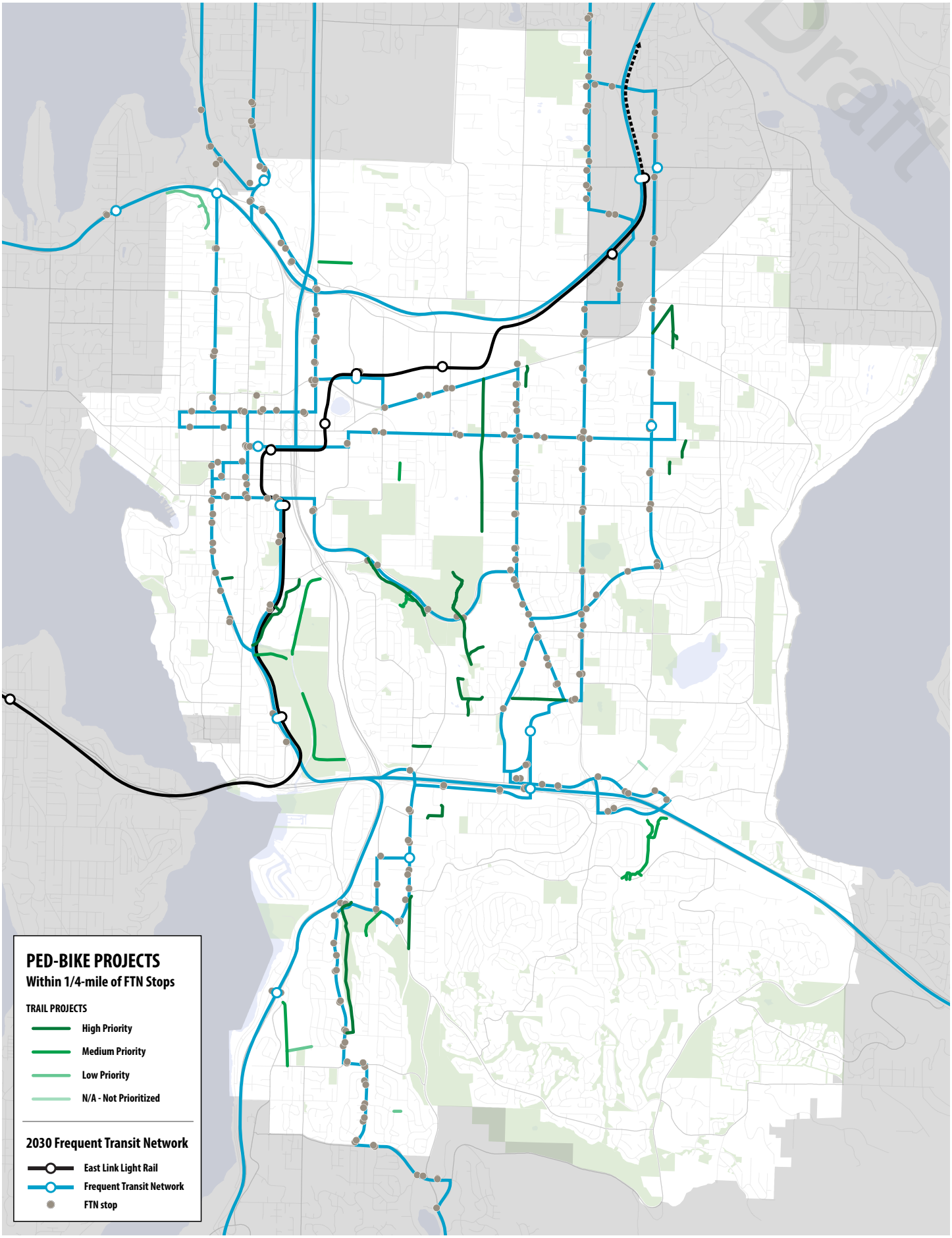
With only twenty-nine projects, trails are the least numerous of the transit-priority non-motorized projects (excepting the four multi-modal intersection projects). Though they represent less than 9 percent of all projects, they are the group with the highest ratio (62 percent) of projects rated high priority by the 2009 Ped-Bike Plan. However, based on their locations relative to FTN stops and the alignments of these projects, they may as a group also generally provide somewhat less benefit to transit access, though this cannot be asserted conclusively without further analysis.

Several trail projects provide connections between neighborhoods and bus stops through the green spaces that separate them. For example, T-204 and T-205 connect Wilburton and Sunset, respectively, to an FTN Route 1 stop on Lake Hills Connector. However, because these trails are winding, which reduces route directness, and the neighborhoods are distant from the bus stop even measured by straight-line distance, these facilities may prove more valuable to serving bicyclists, who can travel farther more quickly, but offer lesser value to pedestrians.

Figure 52 illustrates the impact of route directness using the case of project P-2. For the more than 6,000 employees in this large office area who may wish to travel east-west between points A and B, project P-2 would clearly be a significant improvement by dramatically reducing the walking distance. However, because of the 2030 FTN route structure in Eastgate, with the nearest frequent service operating on Eastgate Way, transit users beginning at point A or B will reach transit by traveling southeast to Eastgate Way, so trail project P-2 will likely do little to shorten the travel distance to transit. Similarly, though project T-302 will provide a north-south gravel trail for residents in Glendale, it will not reduce their east-west travel distance to FTN Route 14 service on 140th Ave, so the benefit to bus access will likely be minimal.

Figure 52 This image from the Eastgate/I-90 Transportation Strategies Report shows how trips that are relatively short "as the crow flies" become burdensome to walk or bike when a person must travel long distances just to get to the road that connects to their destination. Project P-2 would provide a more direct walk between points A and B.

Figure 53 Preliminary transit priority trail projects.



2030 ACCESS ANALYSIS

Table 9 Forecast (2030) populations in Bellevue with access to transit operating 15- and 30-minute frequencies.

Funding Scenario	2030 Employment Projection				Total Jobs
	Quarter-Mile		Half-Mile		
	15-min	30-min	15-min	30-min	
Growing	82.2%	93.3%	95.2%	98.6%	184,300
Stable	82.2%	89.8%	95.2%	97.2%	
Reduced	82.2%	82.2%	95.2%	95.2%	

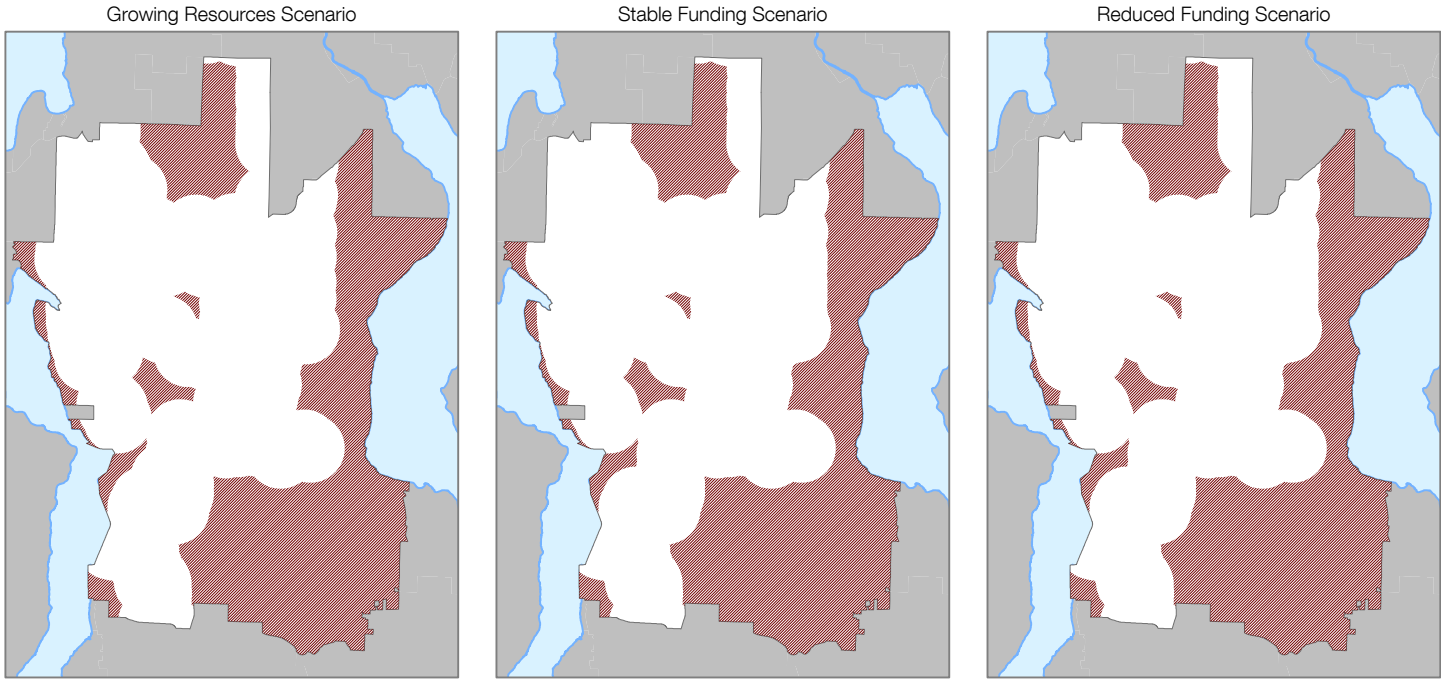
Funding Scenario	2030 Households Projection				Total HH
	Quarter-Mile		Half-Mile		
	15-min	30-min	15-min	30-min	
Growing	58.1%	76.6%	75.4%	91.3%	70,300
Stable	57.7%	68.5%	75.3%	85.4%	
Reduced	57.8%	57.8%	75.3%	75.5%	

Funding Scenario	2030 Population Projection				Total Pop
	Quarter-Mile		Half-Mile		
	15-min	30-min	15-min	30-min	
Growing	51.2%	72.6%	69.9%	89.3%	157,400
Stable	50.9%	63.2%	69.8%	82.1%	
Reduced	50.9%	51.0%	69.8%	70.0%	

For the purposes of a preliminary assessment of transit network accessibility, areas with access reflect those highlighted in Figure 54 below (reproduced from page 74 of the *Transit Service Vision Report*). White areas in the map are within one radial quarter-mile of a bus stop served by one or more 2030 Frequent Transit Network (FTN) routes, which are those routes operating 15-minute headways or better all day. This network service area will also used to prioritize pedestrian and bicycle projects from the perspective of transit, a process addressed on the opposite page.

The Transit Service Vision Report also presented access maps that are expanded to also include quarter-mile radii around Coverage services (Routes 31–36), which are those routes that operate infrequently (every 30 minutes). Also presented are access maps for half-mile radii around FTN and Coverage service bus stops. Although further than many riders who choose to use transit may be willing to walk, a half-mile remains a reasonable service distance to provide for those who depend on transit for some or all of their personal mobility needs.

Figure 54 Access to transit in Bellevue within one-half mile of 15-minute or better service on weekdays (proposed 2030).

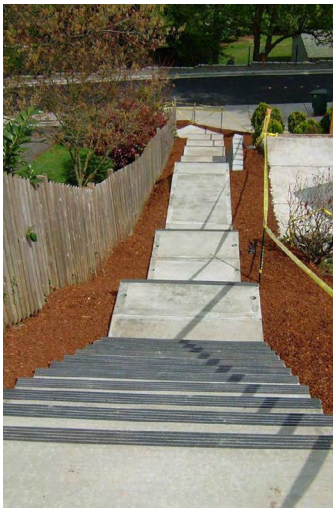


Network Analysis

A more detailed analysis of access to transit is currently underway, which considers factors including network-based distance, travel time, route directness, and terrain grade to assess the degree to which access is improved by transit-priority non-motorized transportation projects. The ongoing analysis will provide a quantitative assessment of how easily people beginning at any given property in the city can reach their nearest transit stop. Figure 55 illustrates the difference between Euclidean (straight-line, or "as the crow flies") and network-based distance by considering three cases. Euclidian distance (orange) is not reflective of how pedestrians travel in cities. The two different cases of network-based distance reflect the walking distance before (purple) and after (yellow) the construction of a staircase between SE 28th Pl and 112th Ave NE, which provides portions of Enatai with more direct access to the South Bellevue Park-and-Ride.

This more nuanced analysis offers several benefits over the quarter-mile radial project screening and access analysis conducted to date. The network-based analysis will be useful when re-evaluating the prioritization of pedestrian and bicycle projects in future updates to the 2009 Pedestrian and Bicycle Plan, as well as for more closely evaluating the relationship between proposed route structures and designated land uses.

Figure 55 The SE 28th Pl stairs to 112th Ave NE dramatically reduce the network-based walking distance to the South Bellevue Park-and-Ride for portions of the Enatai neighborhood.

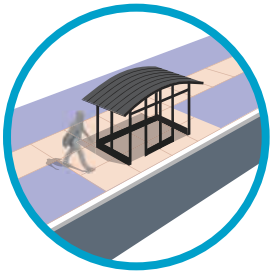


IMAGERY FROM Google Maps

Draft

This page intentionally left blank.

Draft



SECTION 3:
THE TRANSIT STOP

Draft

BACKGROUND

As noted in the previous section, bus systems are comprised of access and transit service networks, and the transit stop serves as the connecting points between these two. The efficient placement of bus stops near major destinations with well-connected pedestrian and bicycle facilities helps to provide communities with viable transportation choices by making the entire transit trip shorter and more pleasant. Also important to the ability of transit to attract ridership is the quality and comfort of the transit stop and its environment.

"The bus stop is the first point of contact between the passenger and the bus service. The spacing, location, design, and operation of bus stops significantly influence transit system performance and customer satisfaction."

- Transportation Research Board, *Guidelines for the Location and Design of Bus Stops* (1996: 1)

The Transit Master Plan (TMP) will not make specific recommendations about bus stop locations for the route networks defined in the *Transit Service Vision Report*. That document provides general stop spacing guidelines based on the various service types defined, and for the purposes of conducting stop-related analyses, some preliminary assumptions have been made about which stops may be served by those networks. However, the elimination of existing stops and siting of new stops requires specific consideration of a variety of factors including existing boarding and alighting patterns at a given stop and others nearby, right-of-way availability, impacts to other traffic, and implications to accessibility. Such analyses will be conducted in the future as implementation planning for the proposed route structures begins.

Instead, this section focuses on three other subjects related to the transit stop:

1. Bus stop amenities
2. Commuter parking
3. Bus layover

The first two of these subjects relate primarily to how transit users experience their first point of contact with the transit system. As shown in Figure 57, these are issues of particular interest to current transit users in Bellevue. Individually, the provision of

real-time bus arrival and schedule and wayfinding information ranked as the second- and fourth-highest priorities for municipal investment in transit, respectively, but together, these investments in improving the information provided at bus stops rank as respondents' most-cited priority. Increasing the capacity of vehicle parking at park-and-ride lots was the third most commonly-cited priority for municipal investment, and while the City does not build or maintain its own parking facilities for transit users, it can help to facilitate partnerships with other local organizations that have a surplus of underutilized parking to permit use of those facilities for park-and-ride purposes.

While the first two subjects addressed in this section are user-centric, the third subject—bus layover—deals with operational considerations. The layover, or amount of time between the end of one trip and the start of the next trip, requires that space be provided at transit facilities or designated along nearby streets or parking lots for transit vehicles to park while not in service. Inefficiencies result when vehicles must travel from their route terminal to reach the layover location. Understanding how much layover space will be required and where that space can most efficiently be accommodated can help to ensure that the scarce regional transit resources allocated to Bellevue are used to provide service to passengers, not lost to operational inefficiencies.

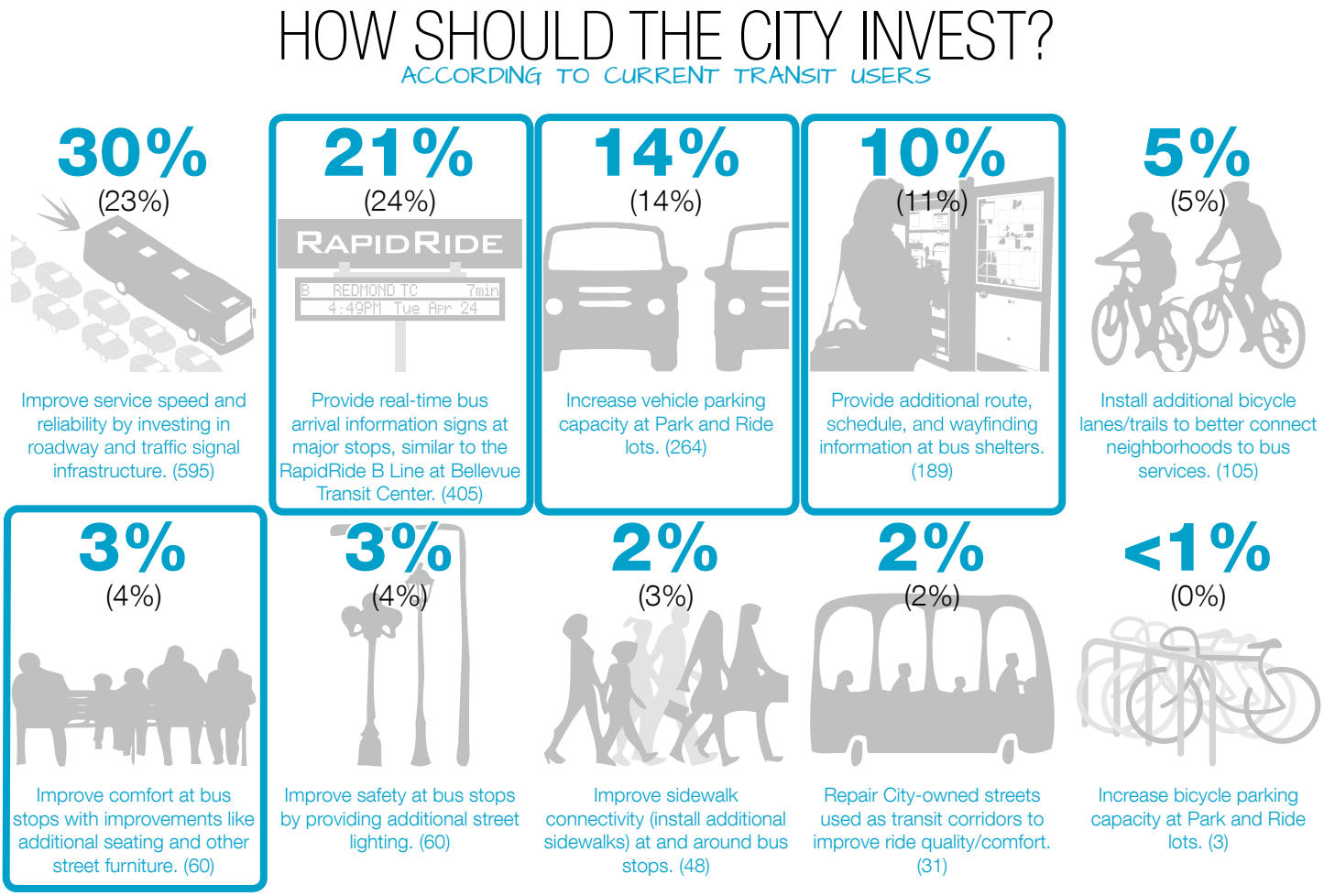


Figure 57 Priorities for municipal investment in transit among those who currently use transit services in Bellevue, according to the Bellevue Transit Improvement Survey. Large blue percentages reflect all current transit users, small black percentages in parentheses reflect all current transit users who reside in Bellevue, and small blue numbers in parentheses following each description reflect the total number of respondents.

Draft

BUS STOP AMENITIES

Waiting area amenities increase the convenience, comfort, safety, and usefulness of bus stops and influence the overall attractiveness of public transportation. Stop locations that are designed with paved waiting pads, shelters, benches, lighting, windbreaks, route information, trash bins, bicycle racks, and, in some cases, off-board pay stations and real-time arrival information make bus stops more hospitable places to be. While frequent services help to reduce the amount of time transit users will typically have to wait at a bus stop, waiting area amenities can make for a more pleasant experience, regardless of how long or short the wait.

Although a form of public space that few would consider a destination unto itself, thousands of people spend time standing or sitting at bus stops every day. So to the extent possible, stops should be designed with the same care and attention to user experience as other more esteemed aspects of the public realm. However, unlike other public amenities like parks and plazas, bus stops are more numerous, scattered throughout much of the city, and despite being sited in widely varying urban and suburban contexts (e.g. along major urban arterials and in quiet residential neighborhoods), stops must remain similar enough to one another to be easily recognized as part of a coherent network. Given scarce resources, investments in improving waiting areas should be targeted to locations that demonstrate a particular need.

Figure 58 Stop-level daily boardings (ons) in Spring 2013.

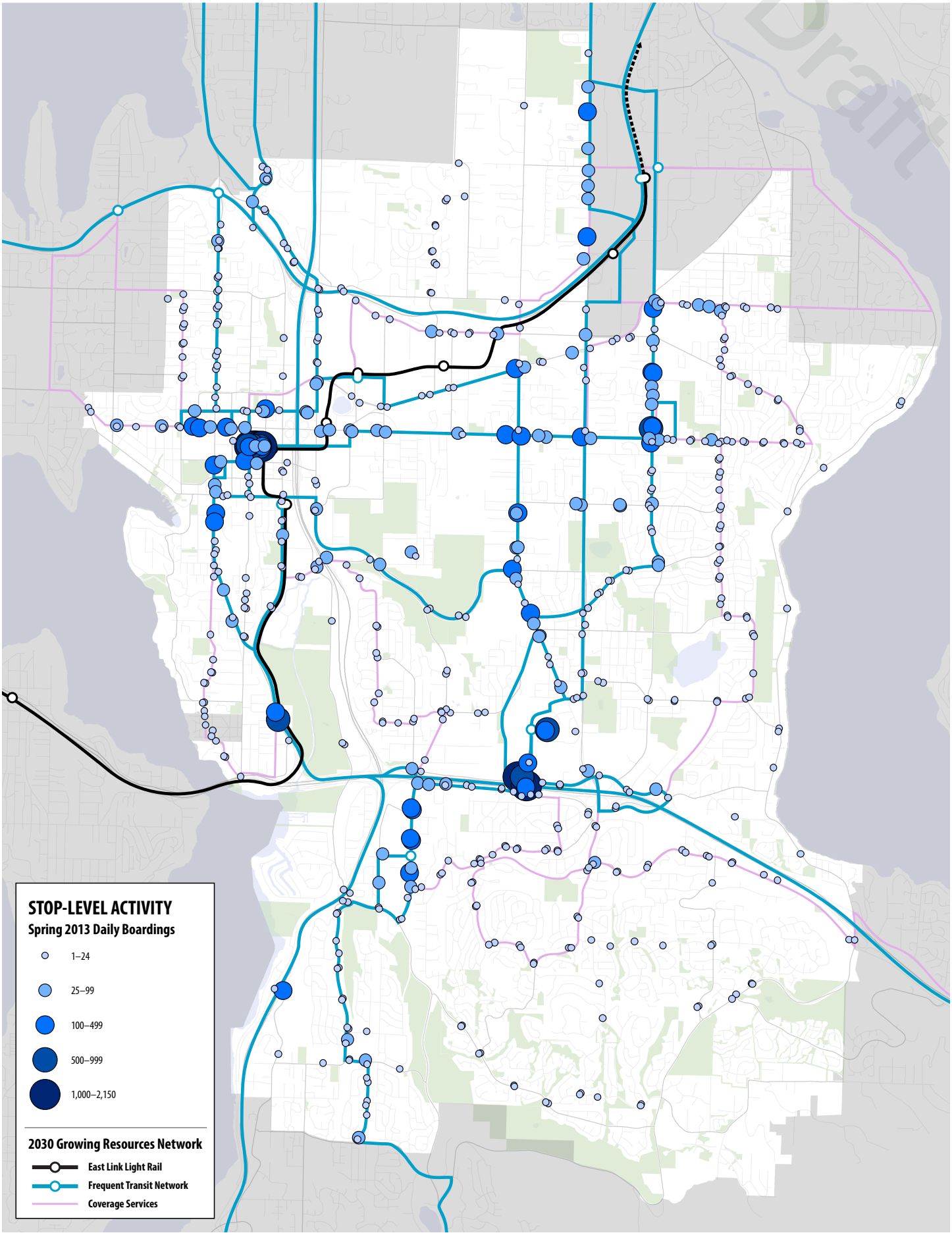


Figure 59 Most bus shelters in Bellevue are similar to these, which may include benches and murals reflective of the surrounding neighborhood.

Figure 60 Stops served by RapidRide lines throughout the King County Metro system are distinguished from other services by the style, materials, color of and amenities at stations and stops.

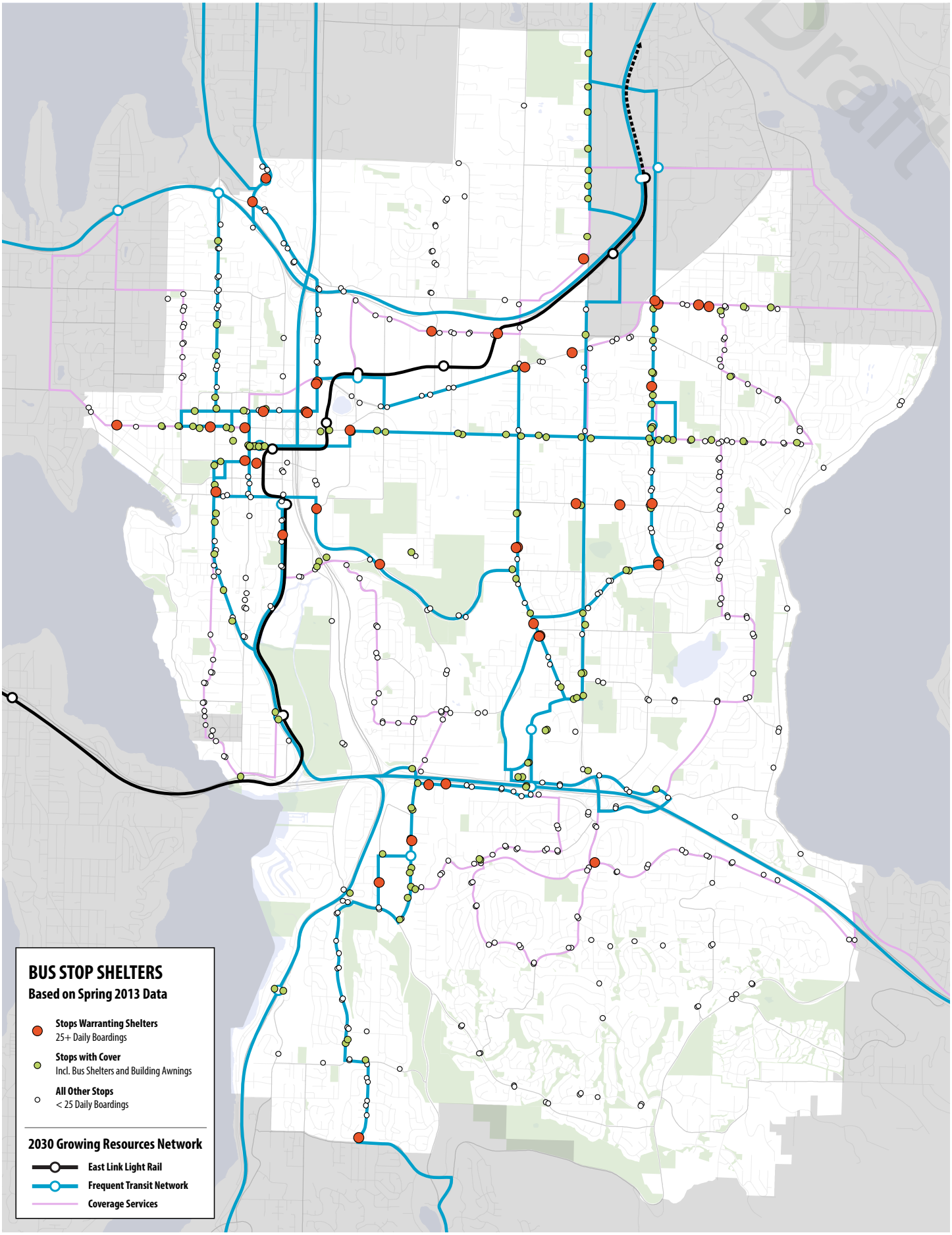
Figure 61 This stop on 108th Ave NE—Bay 1 of the Bellevue Transit Center—provides an example of a building awning providing shelter for pedestrians and waiting transit users alike.

Bus Shelters

The most fundamental of the various bus stop amenities is the bus shelter, which provides protection from the elements and seating. In areas where building frontages are adjacent to the sidewalk—most common in Downtown (see Figure 61) and other neighborhoods with mixed-use development—awnings can be designed to serve as waiting areas for transit users with built-in cover from the elements. In most other parts of the city, where the only overhead protection from the elements is likely to be the tree canopy, if any at all, free-standing bus shelters like those pictured in Figure 59 are typically used. Benches are often provided in these shelters, and the Metro Bus Shelter Mural Program offers communities an opportunity to paint shelter panels to reflect local character. All stations and stops in Metro's RapidRide network use a consistent shelter typology (see Figure 60) to clearly identify this enhanced service type from those that serve standard bus stops.

Several factors influence the determination of need for various stop amenities. For stop shelters, the primary consideration is stop-level passenger activity. King County Metro's bus shelter warrant standard requires shelters to be installed at stops with 25 or more average daily boardings. Figure 58 depicts the number of stop-level daily boardings (ons) at all bus stops served in Bellevue in Spring 2013. The 2030 Growing Resources network is shown in the background for reference, as investments in shelters should be targeted to stops that will continue to be served as the network evolves in the coming years. Figure 62 depicts the bus stops served by the Spring 2013 transit network that do and do not provide passengers with cover. Green icons reflect all stops with some form of cover, including some variety of bus shelter or building awning. Red icons indicate stops that serve sufficient daily boardings (25+) to warrant a bus shelter but currently lack cover;

Figure 62 Bus stops warranting shelters based on Spring 2013 stop-level boardings and alightings (ons/offs).



Draft

Figure 64 A covered pedestrian walkway connects the Kingsgate Park-and-Ride with the nearby Totem Lake Freeway Station on I-405 in Kirkland. A similar concept is envisioned for the Eastgate Park-and-Ride and Freeway Station.

Figure 63 Major stops like the Eastgate Freeway Station provide riders with more information than standard bus stops, including more comprehensive schedule information and route maps.

white icons do not have shelters and do not serve sufficient daily boardings to warrant installation of a shelter by Metro. Refer to Appendix C1 on page A205 for a list of all bus stops served in Spring 2013 warranting shelters.

However, while passenger activity is the primary consideration, other factors may also warrant installation of a bus shelter in the absense of high ridership. For example, stops with nearby healthcare facilities or services oriented toward older adults, rapidly growing areas, or areas that are particularly vulnerable to the elements, such as highway overpasses (e.g. 142nd Pl SE) may indicate a need for targeted investment to improve passenger comfort and encourage additional transit use. In general, all new bus stops should be constructed with sufficient space to accommodate a standard bus shelter and bench, even if these are not installed when service to the stop begins. However, some existing bus stop locations may not have been established with this standard in mind. It is therefore possible that some stops that serve a sufficient number of daily boardings to warrant a shelter cannot have one installed due to insufficient available right-of-way or other limitations.

Schedule Information

Although shelters are the amenity with the most readily apparent impact on the transit user's experience while waiting at the bus stop, other features that improve comfort, convenience, and information can also contribute to passengers' decision to use transit instead of traveling by some other mode. According to current transit users who completed the Transit Improvement Survey in early 2012, the most highly-valued of these other amenities relate to the provision of schedule information. When asked how the City should invest municipal resources to improve transit in Bellevue, 21 percent indicated

that real-time bus arrival information should be provided at major stops, similar to that available for the RapidRide B Line at the Bellevue Transit Center (see Figure 65) and other stations along that route. Although King County Metro currently has no plans to implement this feature more broadly at standard bus stops throughout its service network, precedent exists in the region for municipalities to pursue such investments on their own.

Thanks to technological advances and the increased availability of data in recent years, software like OneBusAway allows users to track upcoming bus arrivals in real-time from any internet-connected home computer or mobile device. For transit users on the go with compatible cell phones or tablets, this free software helps to reduce the actual and perceived amount of time spent waiting at a bus stop and improve the perception of transit service reliability. However, those without such devices must continue to rely on posted schedules at all non-RapidRide stops in Bellevue. In Seattle, the Department of Transportation has installed digital monitors in downtown storefront windows adjacent to several high passenger activity bus stops that display real-time arrival data for all routes serving those stops (see Figure 66).

At this time, the City of Bellevue has not yet adopted plans or allocated capital improvement funds to embark on a similar program. However, given sufficient community interest, available resources, and willing business property owners adjacent to transit stops, the opportunity exists for the City to pursue such investments at costs many times less than most other transit infrastructure improvements.

Draft

Figure 65 Real-time arrival information signboard installed by King County Metro at the Bellevue Transit Center for RapidRide B Line service.

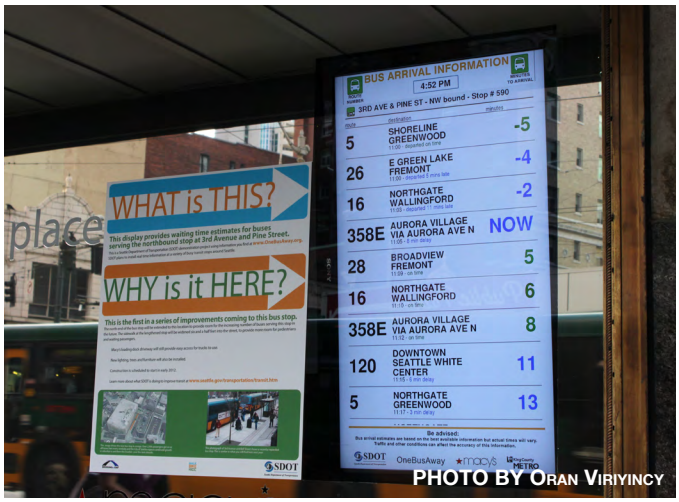


Figure 66 A digital signboard in Downtown Seattle, funded and installed by the Seattle DOT, displaying real-time arrival information from OneBusAway.

Draft

COMMUTER PARKING

BACKGROUND

Commuter parking facilities play an important role in concentrating transit rider demand, often in lower-density areas that would otherwise be unable to support frequent services. These facilities provide convenient access to transit via automobile or bicycle for people who do not live within convenient walking distance of a standard bus stop. Park-and-ride facilities also serve as a meeting place for carpool and vanpool partners.

As the regional inventory of housing and employment grows, the demand for roadway capacity increases. Because roadway capacity and the ability to expand roadways is limited, park-and-ride lots provide an important amenity that supports the use of alternatives to the single-occupant vehicle, thereby requiring less overall roadway capacity. Further, by concentrating transit boardings at a single point, a more frequent level of service can be supported. This section reviews commuter parking demand assessments for the I-405 and I-90 corridors and considers this demand in light of existing parking facilities. This analysis predicts that if a transit network were established that is consistent with the 2030 Growing Resources Scenario depicted in Bellevue's *Transit Service Vision Report*, then there would be an undersupply of parking stalls available along the two study corridors serving Bellevue, I-405 and I-90. If an unlimited supply of parking were available along each of the corridors, the I-90 corridor would be short by approximately 6,300 park-and-ride stalls, and the I-405 corridor would be short by approximately 4,600 stalls.

An assessment of commuter parking facility needs is long overdue. Although King County Metro publishes *quarterly reports* detailing the utilization

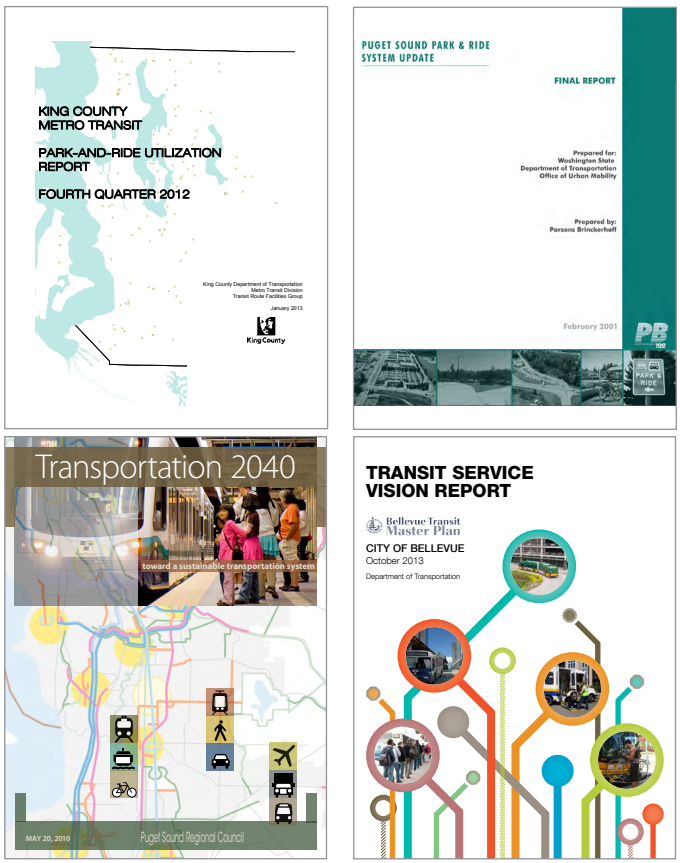


Figure 67 King County Metro publishes *Park-and-Ride Utilization Reports* (top left) quarterly, while the *Puget Sound Park & Ride System Update* (top right) by WSDOT is the last study reporting on the regional demand for park-and-ride capacity. PSRC's *Transportation 2040* (bottom left) and the TMP's *Transit Service Vision Report* (bottom right) also provide context for this report's assessment of park-and-ride capacity in Bellevue.

Draft

of all 131 park-and-ride facilities operating in the Metro service area, regional needs were last studied in 2001 when the Washington State Department of Transportation (WSDOT) conducted a study of park-and-ride lots in King, Pierce, Snohomish, and Kitsap Counties (Parsons Brinckerhoff 2001). This *Puget Sound Park & Ride System Update* recommended that commuter parking needs should be reassessed every five to ten years to maintain their usefulness as a planning tool. The Puget Sound Regional Council (PSRC) also stated in *Transportation 2040* that transit agencies, WSDOT, and PSRC all recognize the need to re-examine the region's commuter parking strategy.

This section analyzes capacity, use, and projected demand data for park-and-ride lots along two corridors: I-405 and I-90, as defined by the 2001 WSDOT study. Consistent with the *Bellevue Transit Master Plan*, the planning horizon for this study is through 2030, and projected demand is based on the transit network proposed by the 2030 Growing Resources scenario in Bellevue's Transit Service Vision Report. This assumes an increase in transit service of about 47 percent from Spring 2012 to accommodate the projected near tripling of transit demand by 2030.

"For those of us who commute into Downtown Seattle, it isn't very realistic to catch the bus from our neighborhoods and transfer. So we depend upon the Park and Rides. It is therefore crucial that adequate parking spaces be provided at the Park and Rides in order for Bellevue residents to use transit for commuting."

-Sarah, Work and Special Event Transit User
Resident of Bellevue[1]

[1] Write-in comment from the *Transit Improvement Survey Summary Report* (2012).

Draft

CONTEXT

Comprehensive Plan Policies

In recognition of the important role that commuter parking facilities play in providing local and regional access to transit, consolidating demand for service, and reducing vehicle trips and traffic congestion, the City of Bellevue *Comprehensive Plan* includes several policies related to commuter parking facilities. The City is dedicated to providing effective commuter parking options and to working in partnership with transit providers and the State to increase capacity as needed by expanding existing facilities, developing additional facilities, and pursuing lot lease agreements with other local entities.

POLICY TR-53. Work with transit providers to maintain and improve public transportation services to meet employer and employee needs. Develop and implement attractive transit commuter options, such as park and ride facilities and local shuttle systems with sufficient frequencies to increase use of transit for commuting and reduce reliance on private automobiles.

POLICY TR-62. Work to ensure that the regional transit system includes park and ride lots to serve activity centers in the region and on the Eastside to:

1. Intercept trips by single occupant vehicles closer to the trip origins;
2. Reduce traffic congestion;
3. Reduce total vehicle miles traveled

POLICY TR-64. Encourage transit providers and the state to provide new and expanded park and ride lots to adequately serve city residents and to develop additional capacity outside Bellevue at other strategic Eastside locations to serve outlying residents.

PHOTO BY John Tiscornia

Figure 68 With more than 1,600 stalls, Eastgate Park-and-Ride concentrates ridership, thereby facilitating service by multiple transit routes that provide more frequent service than would otherwise be possible in the surrounding area.

Draft

POLICY TR-65. Work with transit providers and local property owners to develop new leased park and ride lots.

POLICY TR-75.27. Provide reliable access to the system for Bellevue residents in cooperation with local and regional transit providers, by ensuring that adequate existing and new park and ride lot capacity, neighborhood bus connections and local and regional express bus services are available.

POLICY TR-75.30. Evaluate proposed new park and ride facilities and expansion of existing park and ride facilities to serve light rail transit, for their effectiveness to serve the community and the light rail system, and for their potential environmental and community impacts. New or expanded park and ride facilities should be consistent with the Comprehensive Plan vision for each specific location.

Community Input

The Bellevue Transit Master Plan provides insight into the value of commuter parking facilities in relation to other components of the transit system. In particular, the Bellevue *Transit Improvement Survey*, completed in October 2012, and the *Existing and Future Conditions Report*, completed in August 2013, provide context about the issue of commuter parking in Bellevue in terms of their use and perceived value.

According to the Bellevue Transit Improvement Survey, investment in park-and-ride facilities is the third-highest ranked priority among ten alternative municipal investment options (see Figure 70 on page 70). Only investment in speed and reliability infrastructure and the provision of real-time information were ranked as higher priorities.

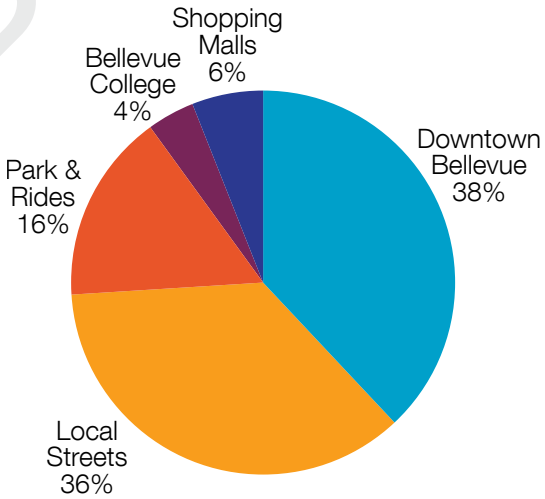
"...[M]ore parking needs to be made available at Park-and-Ride lots to enable more users to ride the buses. I would utilize bus service more if there was a safe place and convenient place for me to park my car!"

-Michelle, Non-Rider
Resident of Snohomish[1]

[1] Write-in comment from the *Transit Improvement Survey Summary Report* (2012).

Draft

Figure 69 Transit use patterns in Bellevue based on Fall 2011 boarding and alighting (on/off) data.



While park-and-ride lots are clearly an important amenity supporting transit use in Bellevue, the *Existing and Future Conditions Report* indicates that the majority of people riding transit in Bellevue access bus service at other types of facilities (Figure 69). In Fall 2011, about 38 percent (15,408/27,889) of daily ons/offs took place in Downtown Bellevue, including at the transit center; about 36 percent (14,523/27,889) occurred on local streets outside of Downtown Bellevue; and park-and-ride facilities, including Eastgate (2,166), South Bellevue (1,588), Newport Hills (281), Wilburton (51), and the Eastgate Direct Access Ramp (2,270), collectively accounted for about 16 percent of daily boardings and alightings.

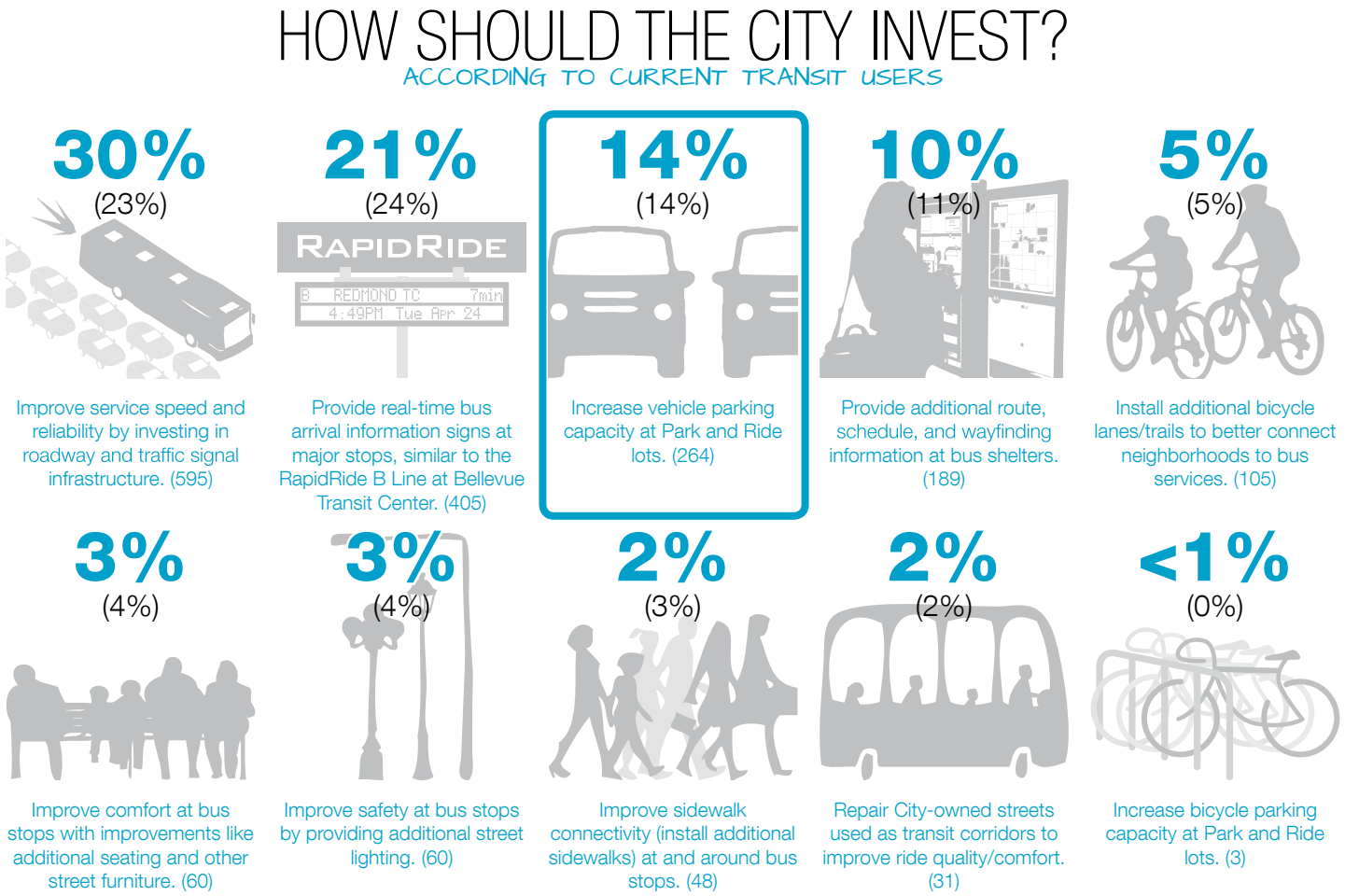


Figure 70 Priorities for municipal investment in transit among those who currently use transit services in Bellevue, according to the Bellevue Transit Improvement Survey. Large blue percentages reflect all current transit users, small black percentages in parentheses reflect all current transit users who reside in Bellevue, and small blue numbers in parentheses following each description reflect the total number of respondents.

PARK-AND-RIDE USE

Draft

For the purpose of this report, park-and-ride usage is measured by corridor, which were first established by WSDOT's 2001 *Puget Sound Park & Ride System Update* (Parsons Brinkerhoff, 2001). Corridors provide organizational structure to the existing park-and-ride lots. Capacity needs for park-and-ride lots are considered in general—not in a lot-specific sense—allowing for more flexibility in analyzing the findings and in developing solutions.

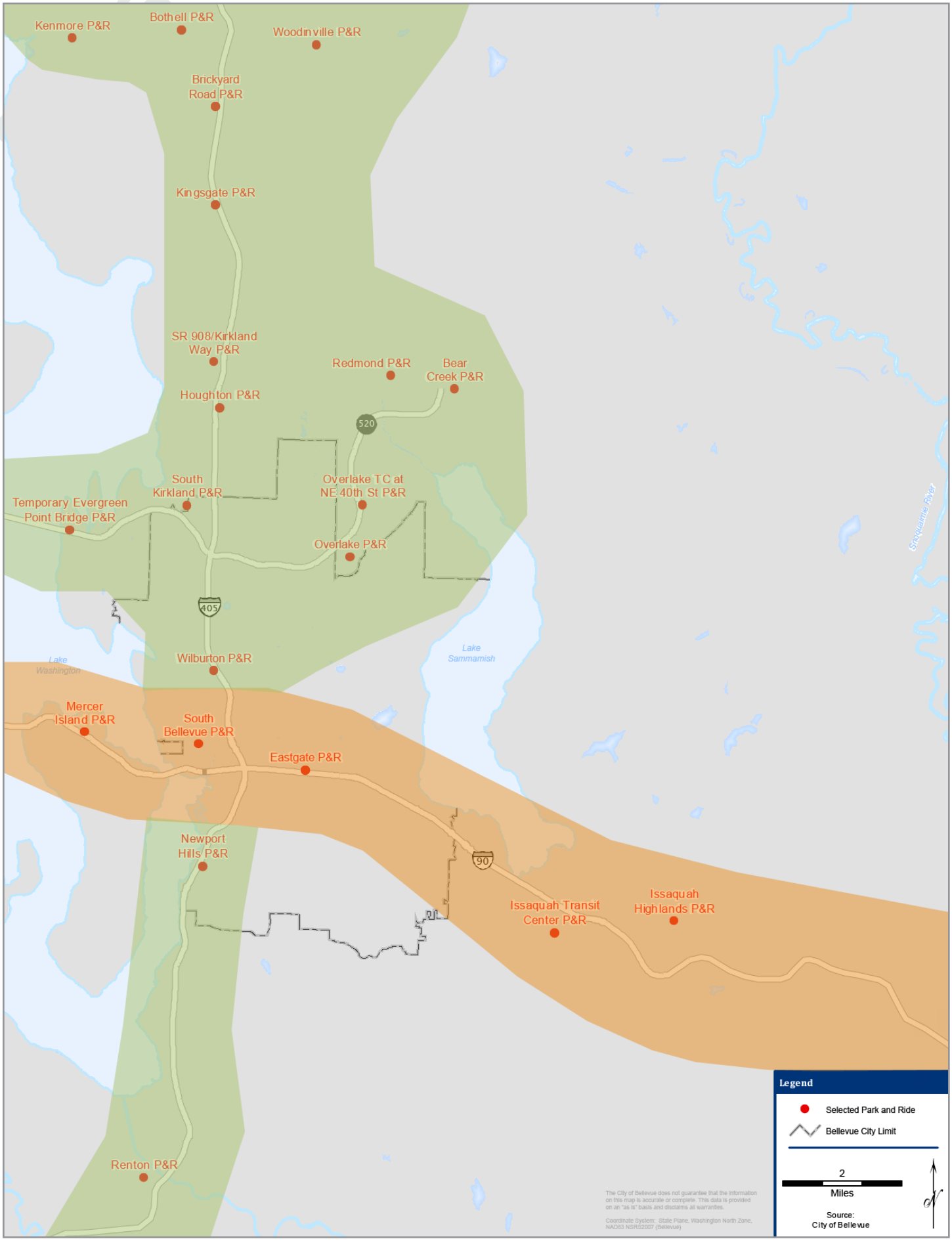
Corridor-level analysis allows for the capture of both local park-and-ride demand and demand that may be shifting between facilities within the corridor. Shifts between facilities, called "lot substitutions," are caused when a transit rider travels further—or in some conditions a short distance in the direction opposite of their destination—to reach a lot with more favorable conditions. These favorable conditions often include higher frequency services, a wider range of destinations, or more parking lot capacity. Lot substitution is observed in Bellevue where transit riders pass park-and-ride lots closer to their homes in favor of parking at the South Bellevue Park-and-Ride, where faster and more frequent service is available. The map in Figure 71 on page 72 depicts lots representing the corridor broadly defined by I-405 in green, and those within the I-90 corridor are shown in orange. This map shows Bellevue and its surroundings with selected park-and-ride lots located within the identified corridors.

A review of park-and-ride usage in the Puget Sound region over the past ten years reveals two trends. First, there is an uneven regional distribution of park-and-ride use. Several lots east of Bellevue and/or an inconvenient distance from the Frequent Transit Network (FTN) are under-capacity, while several lots in western Bellevue such as the South Bellevue Park-and-Ride are over-capacity, as shown by the images in Figure 72. This imbalance of lot usage indicates that

"Park and Rides are full in Bothell and Lynnwood very early - doesn't align with school schedules"
-Elesa, Non-Rider
Resident of Bothell[1]

[1] Write-in comment from the *Transit Improvement Survey Summary Report* (2012).

Figure 71 Park-and-ride lots in the I-405 (green) and I-90 (orange) corridors.



lot location in relationship to the FTN is an important factor to consider when siting new facilities.

Figure 73 on page 74 presents a trend of increasing utilization of park-and-ride lots. Overall usage of park-and-ride lots in both corridors increased from 5,375 to 8,779 stalls used daily between 2000 and 2013, a 63 percent increase. An analysis by corridor reveals that park-and-ride usage rose by 128 percent (2,497 vehicles) for the I-90 corridor from 2000 to 2013, and usage in the I-405 corridor rose by 26 percent (907 vehicles) over the same period. Refer to Appendix Table 7 on page A208 for the complete associated data. Contributing to this increased use is the construction of the new 1,600-stall Eastgate Park-and-Ride facility in 2005. The 2013 opening of a 525-stall parking garage at the South Kirkland Park-and-Ride facility is further increasing usage. As shown in Table 10 on page 74, there are a total of 3,377 park-and-ride stalls and 351 leased lot stalls within Bellevue city limits as of December 2013. Occupancy rates for leased lots vary considerably among Metro's quarterly utilization reports.

Park-and-ride usage in Bellevue varies by the size and location of the lot. Two of the most popular lots are profiled in the appendices of this report: South Bellevue Park-and-Ride and Eastgate Park-and-Ride. The South Bellevue Park-and-Ride is a surface parking lot with a 519-stall capacity. It is heavily utilized, especially by users originating a great distance from the lot. Forty-four percent of all users commute from a distance of greater than five miles from the lot. The Eastgate Park-and-Ride is a five story parking structure with a capacity of 1,614 vehicles. The composition of the users of the Eastgate Park-and-Ride differ from those of the South Bellevue Park-and-Ride lot in that 52 percent of the users commuted between only one and three miles to reach the lot. Additional information about these two park-and-rides is provided in Appendix C2 beginning on page A208.

Draft

Figure 72 The South Bellevue Park-and-Ride is often over capacity, with vehicles parked along the shoulders of the driveway (circled).

Draft

Table 10 2013 park-and-ride and leased lot capacity and usage.

Park-and-Ride Facility	Lot Capacity	% Occupancy
Park-and-Ride Lots:		
Eastgate	1,614	99%
Newport Hills	275	84%
South Kirkland (Bellevue and Kirkland)	783	75%
South Bellevue	519	107%
Wilburton	186	87%
Total	**3,377**	
Leased Lots:		
Bellevue Christian Reformed Church	20	38%
Bellevue Foursquare Church	35	20%
Eastgate Congregational Church	20	100%
Grace Lutheran Church	50	100%
Newport Covenant Church	75	24%
Newport Hills Community Church	37	64%
St. Luke's Lutheran Church	30	18%
St. Andrew's Lutheran Church	20	63%
Total	**351**	

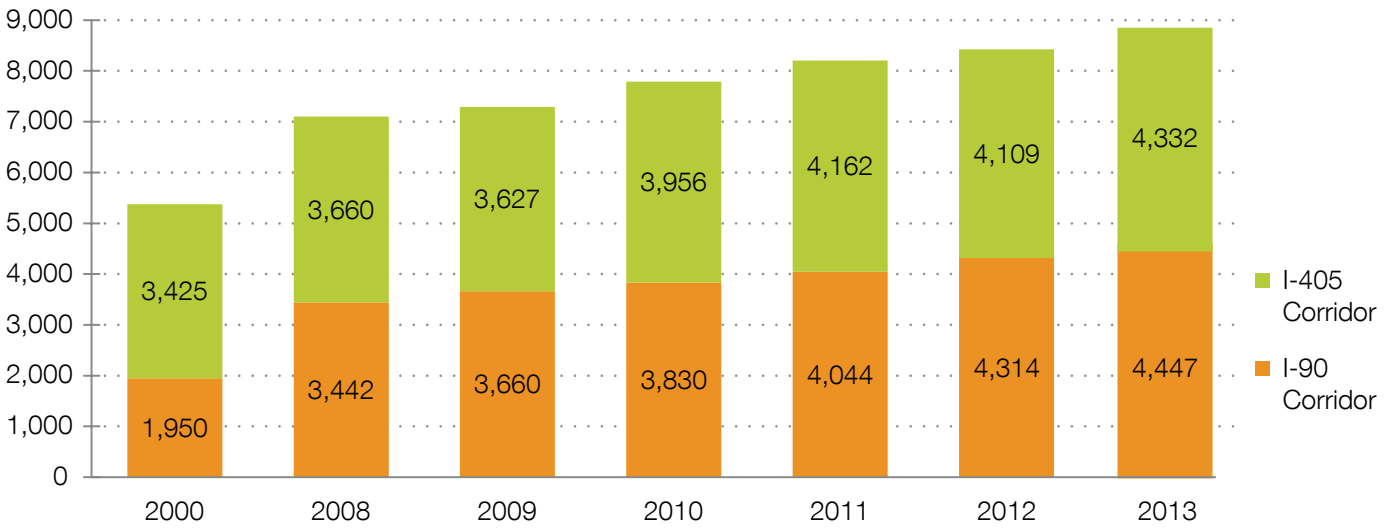
2030 PARK-AND-RIDE USE

To quantify corridor-level park-and-ride demand under constrained and unconstrained conditions, forecasts were developed based on the 2030 Growing Resources Scenario depicted in Bellevue's *Transit Service Vision Report*. Demand projections used the Bellevue-Kirkland-Redmond (BKR) Travel Demand Model (MP0r12). The demand for park-and-ride use in the I-90 and I-405 corridors is estimated using all standard assumptions in the model, except that the unconstrained demand estimates remove capacity as a constraint for all park-and-ride lots.

The following are standard assumptions and sources from the BKR Travel Demand Model:

- Baseline data is derived primarily from a regional survey conducted by the Puget Sound Regional Council (PSRC). This data is validated by census data and data from the PSRC regional household travel survey.
- The base-year model platform is updated annually to reflect changes in the land use and roadway network.
- The model is then validated with observed traffic counts and transit ridership on an annual basis.

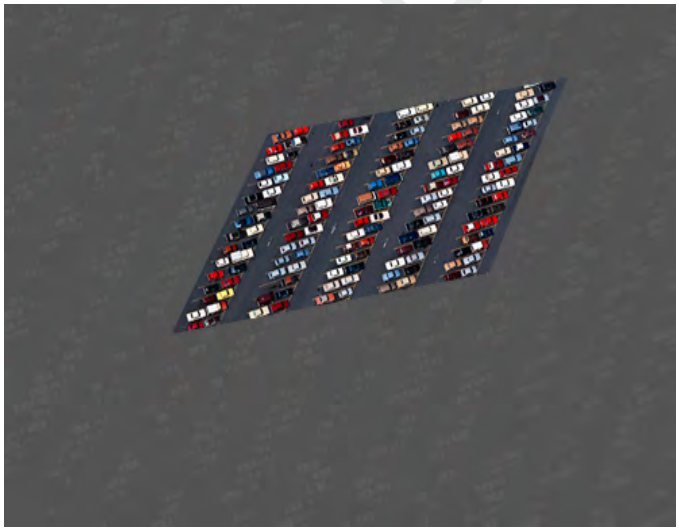
Figure 73 Historic fourth quarter utilization of park-and-ride facilities in the I-405 and I-90 corridors (King County Metro 2008 to 2013, Parsons Brinkerhoff 2001).



– As travel survey data becomes available, enhancements are made to the BKR base model to more accurately project travel demand.
– Trip assignments constrain transit capacity, and park-and-ride capacity typically constrains the mode split process.
– The same park-and-ride attractiveness factors are carried forward from the constrained demand projection to the unconstrained demand projection.
– Attractiveness factors include size and ratio of lot size to average lot size in the system, and these are represented by a proxy figure in the model. Characteristics of transit service quality, such as frequency of service at a given park-and-ride facility, are not specifically considered by the model.

Both constrained and unconstrained scenarios use the same set of assumptions but differ only in that the constrained scenario limits the parking capacity to the expected size of each lot and the unconstrained scenario places no limit to the number of available parking stalls. This concept is graphically illustrated by Figure 74.

Constrained



Unconstrained

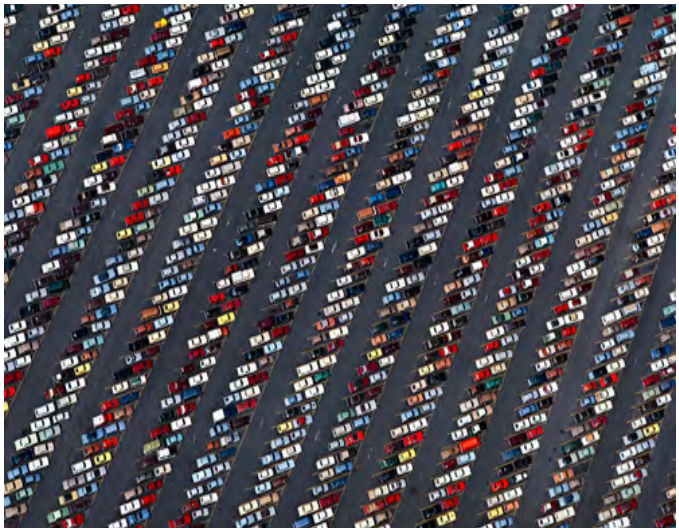


Figure 74 The parked cars in these images represent the difference between constrained (above) versus unconstrained (below) scenarios in the 2030 travel demand forecast.

Draft

Figure 75 Constrained and unconstrained demand for park-and-ride lots along the I-90 corridor.

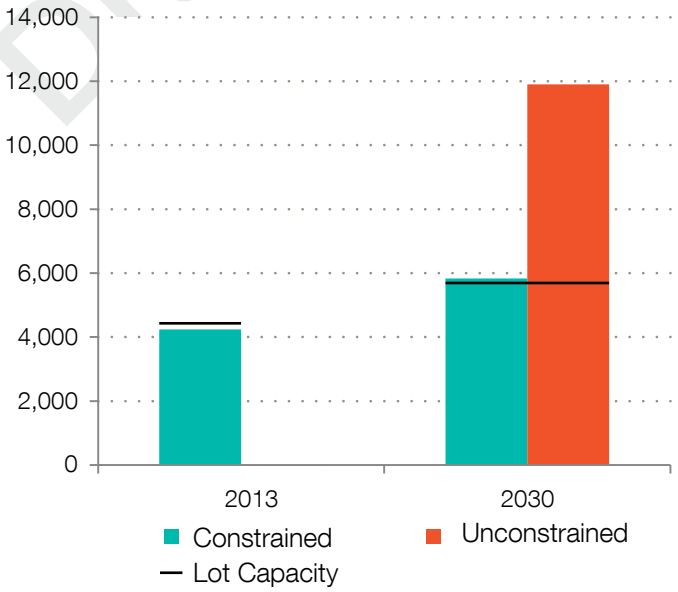
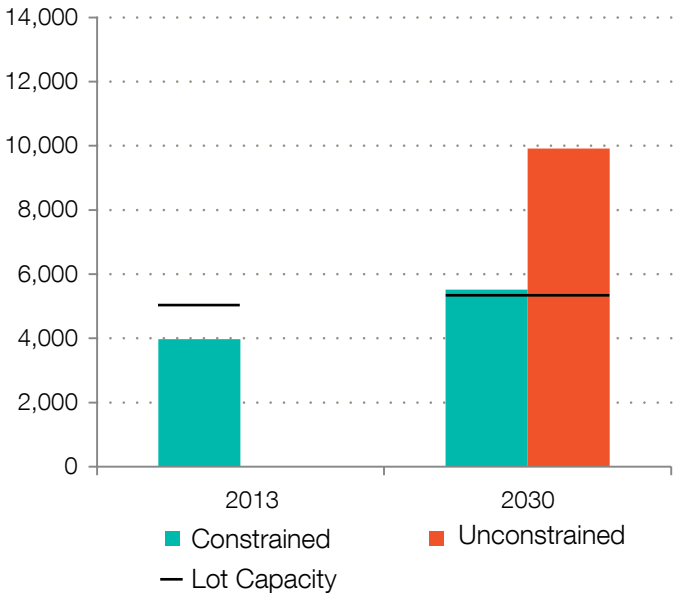


Figure 76 Constrained and unconstrained demand for park-and-ride lots along the I-405 corridor.



Modeling Results

Anticipated demand for park-and-ride lots in 2030 is shown for the I-90 and I-405 corridors in Figure 75 and Figure 76, respectively, based on the modeling methodology outlined in the previous section. Refer to Appendix Table 8 and Appendix Table 9 on page A208 and Appendix Table 12 on page A209 for the complete associated data. These charts show that for the year 2030, both constrained and unconstrained demand for each of the two corridors exceeds projected lot capacity for each corridor. If an unlimited supply of parking were available at all park-and-ride lots in both corridors, the model predicts that an additional 6,300 stalls would be required in the I-90 corridor and an additional 4,600 stalls would be required for the I-405 corridor to meet anticipated commuter parking demand in these corridors.

Model results show that unconstrained demand is approximately 200 percent greater than constrained demand, suggesting that new riders will likely begin using the system given increased parking availability.

RECOMMENDATIONS

Draft

There are many ways to address the projected regional shortage of park-and-ride spaces. This section presents both supply and demand side solutions. From the supply side, it is recommended that new lots be constructed or existing lots be expanded using the guidance from this section regarding sizing and siting strategies. From the demand perspective, it is recommended that service be fast, reliable, and accessible. It is also recommended that service be provided in residential areas through the use of leased lots. While traditional park-and-ride lots are located near highways and arterials, leased lots could provide access to the Frequent Transit Network for low density residential areas, and their locations would blend in with the character of these neighborhoods. Finally, this section discusses several regional strategies already underway to improve the capacity of park-and-ride lots.

Siting and Sizing Strategies

A strategic response to the unmet commuter parking needs in the I-90 and I-405 corridors warrants consideration of guidance found in "Characteristics of a Successful Rapid Transit-Focused Park-and-Ride Lot," within *TCRP Report 153: Guidelines for Providing Access to Public Transportation* (see Figure 77). This report identifies the following characteristics of successful park-and-ride lots:

- ***Locate in advance of congestion.*** Park-and-ride lots in combination with rapid transit lines generate the greatest use (and transit ridership) in travel corridors that experience the most intense traffic congestion (i.e., peak-hour peak direction freeway speeds of less than 30-35 miles per hour. Park-and-ride facilities should intercept motorists in advance of congestion and before points of major route convergence.

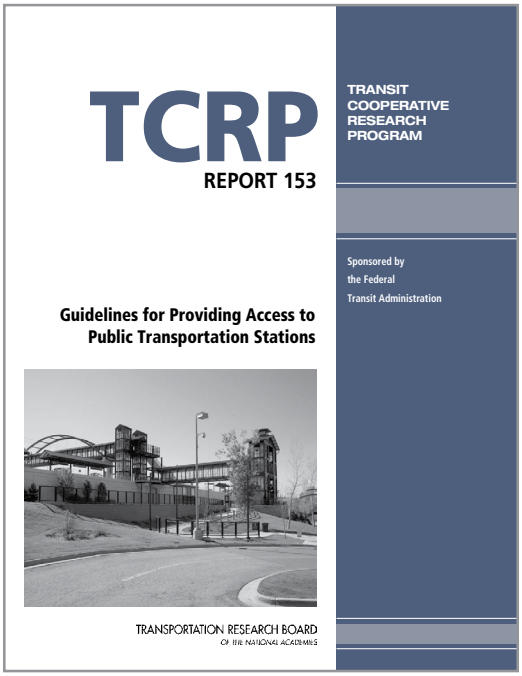


Figure 77 Transit Cooperative Research Program (TCRP) Report 153: Guidelines for Providing Access to Public Transportation Stations identifies qualities of successful park-and-ride lots.

Draft

Sites near junctions of radial transit lines and beltways or major arterial roads can tap a wide catchment area. Access to the lot should be upstream of major congestion points.

- ***Locate sufficiently far away from the city center.*** Park-and-ride facilities should be located as far from the downtown area as practical to remove the maximum number of travelers (and vehicle miles traveled (VMT) from roadways during peak periods. They generally should be located at least 5 to 8 miles from the city center. They should be far enough away to compensate for the time spent changing travel modes. Increasing parking spaces on the fringes of the downtown area is not desirable, as it could divert existing passengers from feeder transit services and non-motorized access modes.

"If the bus route came closer to where I live I wouldn't need to drive to the Park and Ride. So either the city should have a lot more Park and Ride spaces or have more bus routes in unserved parts of Bellevue."

-Pat, Shopping and Social Transit User
Resident of Bellevue[1]

- ***Locate in safe areas.*** Park-and-ride facilities should be placed in areas that are perceived as safe by patrons. They should not be located in high-crime areas, or in settings that are considered unattractive to users.

- ***Complement and reinforce land development.*** Park-and-ride facilities should be compatible with the surrounding environments. Large facilities—especially open-lot parking—should be limited or avoided in town centers, areas of high population and development density, and locations where transit-supportive uses are planned or encouraged around stations. Where garages are built, they should be carefully integrated with their surroundings.

"I sometimes have to pass two Park-&-Ride lots on my route before finding a parking space. By that time, I've driven half-way to work."

-Don, All-Around Transit User
Resident of Kirkland[1]

- ***Provide good roadway access.*** Facilities should be accessible and visible from nearby freeways and arterial roadways.

- ***Serve multiple markets.*** Most rapid transit-focused park-and-ride lots serve downtown travelers. However, there is a growing tendency

[1] Write-in comment from the *Transit Improvement Survey Summary Report* (2012).

to also serve other large activity centers along the rapid transit lines. The lots should be located between their catchment areas and major activity centers. Motorists will use facilities that can be easily accessed en-route, but are less likely to backtrack.

- ***Provide fast and frequent rapid transit service.*** Rapid transit should operate at frequencies of 10 to 12 minutes or less during peak periods, while frequencies up to 20 minutes are acceptable during midday hours. Headways of 20 to 30 minutes are acceptable for commuter rail and commuter bus service during commute hours.

- ***Serve low-density residential areas.*** In general, population densities in park-and-ride catchment areas should be less than 4,000 to 6,000 persons per square mile, or about 4 to 6 dwelling units per net acre.

Leased Lots

Leased lots, or shared-use park-and-ride lots, often blend in well with the character of residential neighborhoods and are a good tool to use to better serve low-density residential areas with transit. While other cities along the I-90 and I-405 corridors regard lease lots as an allowable use in their land use codes, Bellevue currently requires applicants to undergo an administrative conditional use permit application process with approval by the Planning Director. An administrative conditional use permit requires the following: a $4,490 submittal fee (2014), mailed notice to property owners within 500 feet of the site, minimum public comment period of 14 days, and permit application and fees for all signs posted. Processing an administrative conditional use permit can take up to 120 days. This procedure is regulated by Bellevue City Code 20.20.200, which is reproduced in Appendix C3 on page A214 of this report.

Figure 78 Grace Lutheran Church on NE 8th St and 96th Ave NE serves as a leased park-and-ride lot on weekdays, providing access to Route 271 just west of Downtown.

Figure 79 Aerial view of NE 8th St looking west from Downtown, with the Grace Lutheran Church leased park-and-ride lot indicated by the yellow square.

Figure 80 With 50 available stalls, all of which are used on an average day, Grace Lutheran Church is the most-used lease lot in Bellevue.

Table 11 Potential leased lots relative to FTN routes.

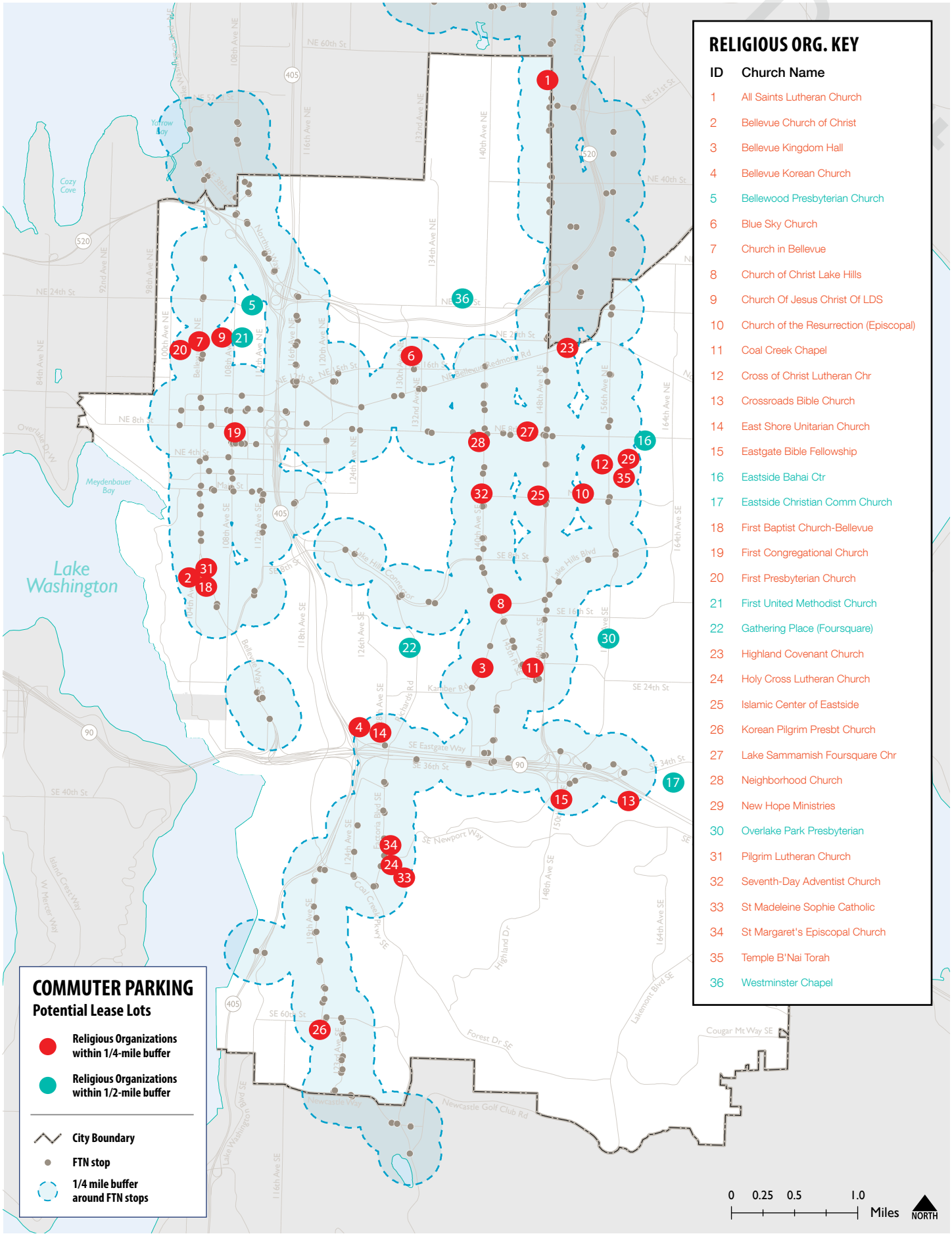
Potential Lease Lot Facility	Address	Distance to Transit (feet)	Lot Capacity
FTN Route 1 (Issaquah Highlands - Bellevue - U District)			
First Presbyterian Church	1717 Bellevue Way NE	440	365
First Congregational Church*	752 108th Ave NE	580	15
Church in Bellevue	1835 Bellevue Way NE	620	66
Bellewood Presbyterian Church	10936 NE 24th St	1,870	70
First United Methodist Church	1934 108th Ave NE	2,210	168
Church of Jesus Christ of LDS	10675 NE 20th St	2,320	160
FTN Route 2 (Lynnwood - Bellevue)			
First Congregational Church*	752 108th Ave NE	580	15
FTN Route 3 (Westwood Village - Renton - Bellevue)			
First Baptist Church - Bellevue*	10431 SE 11th St	180	84
Bellevue Church of Christ*	1212 104th Ave SE	200	90
Pilgrim Lutheran Church*	1030 Bellevue Way SE	200	55
FTN Route 6 (Crossroads - Bellevue)			
Lake Sammamish Foursquare*	14434 NE 8th St	700	240
Eastside Baha'i Center	16007 NE 8th St #100	1,700	6
FTN Route 7 (Redmond - Crossroads - Eastgate - Factoria)			
Overlake Park Presbyterian	1836 156th Ave NE	10	135
Church of the Resurrection	15220 Main St	1,060	100
Cross of Christ Lutheran Church	411 156th Ave NE	1,300	230
Temple B'Nai Torah	15727 NE 4th St	1,800	50
New Hope Ministries	15760 NE 4th St	2,150	52
FTN Route 11 (Bellevue - Factoria - Renton) (In Addition to the Churches in the FTN Route 3 Corridor)			
St Margaret's Episcopal Church	4228 Factoria Blvd SE	250	160
Holy Cross Lutheran Church	12835 SE Newport Way	500	40
Korean Pilgrim Presbyterian	6016 120th Ave SE	500	56
East Shore Unitarian Church	12700 SE 32nd St	1,390	60
Bellevue Korean Church	3105 125Th Ave SE	2,400	34
St Madeleine Sophie Catholic	4400 130th Pl SE	2,400	300
FTN Route 12 (Eastgate - Overlake Village - Kirkland)			
Lake Sammamish Foursquare*	14434 NE 8th St	700	240
All Saints Lutheran Church	5501 148th Ave NE	100	84
Islamic Center of Eastside	14700 Main St	400	14
Highland Covenant Church	15022 Bel Red Rd	650	80
Coal Creek Chapel	14615 SE 22nd St	720	100
FTN Route 13 (Bellevue - Eastgate)			
Eastgate Bible Fellowship	15005 SE 38th St	1,200	100
Crossroads Bible Church	15815 SE 37th St	2,000	580
Eastside Christian Comm. Church	3615 164th Pl SE	2,300	90
Gathering Place (Foursquare)	2015 Richards Rd	2,300	110
FTN 14 (Kirkland - Bel-Red - Eastgate)			
Westminster Chapel	13646 NE 24th St	2,500	630
Neighborhood Church	625 140th Ave NE	150	230
Seventh-Day Adventist Church	15 140th Ave NE	600	65
Blue Sky Church	1720 130th Ave NE #100	700	60
Bellevue Kingdom Hall	2211 140th Pl SE	1,000	35
Church of Christ Lake Hills	14213 Lake Hills Blvd	150	10

* Nearest transit stop is served by multiple FTN routes.

By overlaying the anticipated 2030 Frequent Transit Network with the location of existing faith communities (i.e., churches), it is apparent that there is a potential for lease lots (established at church lots) to relieve future commuter parking demand. If all churches within a half-mile walking distance of the FTN were to share their parking, over 4,700 stalls would become available. Six churches within this group have large parking lots, with over 200 stalls each. For example, the Neighborhood Church, with 230 stalls, has direct access to FTN Route 14. These churches are not evenly distributed among the Frequent Transit Network, with generally greater access to Routes 1, 11, and 14. Churches that are within one quarter-mile radius of FTN transit stops have more than 3,500 parking stalls available. Figure 81 provides a reference map showing the twenty-five church locations that fall within a quarter-mile radius of FTN stops, as well as the seven additional churches that are within a half mile walking distance.

This study identifies faith communities based on a 2013 InfoUSA database. Of the 105 churches listed in this database, 50 have their own dedicated parking lots. Of these 50 locations, 35 churches are located within a half mile walking distance of stops along the 2030 FTN. Table 11 lists the churches relative to each FTN route. It lists the approximate number of parking stalls at each location based on stall counts from aerial photos. The table also provides the distance in feet between the church lot and the nearest FTN-served transit stop.

Figure 81 Potential lease lots within one-quarter and one-half mile radial catchment areas of 2030 Frequent Transit Network stops.



Draft

Regional Efforts Underway

Regional efforts are underway to address park-and-ride needs. King County Metro and The Puget Sound Regional Council initiated an "Access to Transit Work Plan," which will define the role of park-and-rides and other community infrastructure related to access to transit. PSRC's Transportation 2040 recommends that the region study park-and-rides in more depth, including potentially charging for parking at these facilities. Also, Sound Transit is conducting Parking Management Pilot studies (Fall 2013–Early 2015) offering limited permit parking for frequent riders at the Issaquah Transit Center, Mukilteo Station, Sumner Station, and Tukwila International Blvd Station. This study also provides real-time customer information about parking availability at select locations, and collaborates with rideshare programs. Finally, the King County Metro Right Size Parking Project is considering the paid use of parking in multi-family apartment buildings during the day to facilitate access to transit.

CONCLUSIONS

This assessment suggests that there is a significant shortage of commuter parking along the I-90 and I-405 corridors. As the park-and-ride usage trends indicate, commuter parking expansions have occurred in high-utility areas due to their locations in proximity to I-405 and I-90 and their central to western location within the City of Bellevue. Indeed, past experience shows that lots are quickly filled shortly after new park-and-ride facilities are built.

The constrained travel demand model indicates that there are approximately 200 stalls for each corridor that are required beyond those provided. When an unlimited supply of stalls is provided in the model— the unconstrained scenario—there is a shortage of approximately 6,300 stalls along the I-90 corridor and a shortage of approximately 4,600 stalls along the I-405 corridor. Thus, each corridor would need to have twice the number of stalls to keep up with the projected unconstrained demand.

Draft

Draft

BUS LAYOVER

Layover/Recovery Time: The scheduled time spent at a route's terminal between consecutive trips by a single bus.

Deadhead Time: The scheduled time spent driving to and from the base or between trips on different routes.

In addition to serving as the first point of access to transit, the location and environment surrounding bus stops can also have significant implications on transit operating efficiency. Behind the steering wheel of every bus is an operator, and operators are contractually required a certain amount of break time to rest in between individual trips of their route, known as layover or recovery time. An essential aspect of bus scheduling, this time also helps to ensure that a late-running bus still begins its next trip on time. Locations must be identified near route terminals for operators—and their buses—to park while not operating revenue service.

This need for parking space can be accommodated in a variety of ways depending on local conditions. Transit facilities like the Eastgate Park-and-Ride are often designed to provide some layover space on-site (see Figure 82), which is the most operationally efficient solution to implement when possible. Other facilities like the Bellevue Transit Center have the capacity to accommodate current layover needs for some routes at lesser-used bus bays, but as the amount of service operated increases in the future, the available bays may need to all be used by in-service buses, meaning that layover space will need to be identified elsewhere. In such cases, and in cases where a route's terminal is not at a transit facility, bus layover space is commonly designated in the curbside lane of a nearby street. When the use of such space in the street right-of-way is necessary, it is critical that these spaces be designated as close as possible to the route's terminal, as any additional distance that buses need to deadhead from terminal to layover location represents a reduction in operating efficiency. While bus layover may not require the use of the land on a development lot per se, it may require the use of some portion of a block's street frontage. A relationship therefore exists between the transit network and the land

use and urban design of the public realm in the areas surrounding bus route terminals.

This report does not attempt to identify specific locations at transit facilities or along street right-of-ways to be used by transit vehicles for layover. Instead, it provides an estimate of the range of total linear feet of layover space that will be required to operate the 2030 Growing Resources Network defined in the *Transit Service Vision Report*. Because layover space is intrinsically a place-based demand—as noted, it should be as close as possible to the route terminal—the total need is then divided among Bellevue's Mobility Management Areas as an indication of where such space will need to be identified in the future. This provides an actionable basis for further consideration and analysis without being prescriptive about specific details related to siting at this time.

Figure 82 The Eastgate Park-and-Ride has layover space available on-site across from the parking garage and bus bays.

PHOTO BY John Tiscornia

Draft

Draft

Frequency: The number of transit vehicles of the same route passing a point in one direction during one hour, often expressed in terms of the number of minutes between consecutive trips, known as headway.

Span: The time of day during which a particular route operates, expressed as the number of hours between the first and last trips scheduled in each direction.

Cycle Time: For a given route, the sum of the inbound and outbound travel times and layover time.

METHODOLOGY

The process used here to estimate bus layover needs consists of the following five steps:

1. Identify terminals of all 2030 Growing Resources Network services in the greater Bellevue area.
2. Using service frequency, span, and cycle time, estimate layover time for each route at each terminal.
3. Estimate the total number of vehicles that may be laying over at any given time per route.
4. Multiply the number of vehicles laying over at any given time per route by the length (in feet) required to accommodate each vehicle. Different bus length assumptions were used for FTN, coverage, and peak-only routes.
5. Sum all identified layover length requirements by terminal.

In addition to estimating the total linear feet of layover space required, this analysis also estimated the operational cost of not having layover space immediately proximate to the terminal where each route ends. These costs were estimated using thresholds of 2- and 5-minute travel times to the hypothetical layover facility following the four steps:

1. Add twice the threshold travel time (4 or 10 minutes) to the cycle time for each route.
2. Estimate the annual service cost of the additional cycle time.
3. Compare the new service costs to the original annual costs.
4. Sum the difference in service costs for each terminal.

Note that these estimates assumes that *all* trips must travel to a remote layover location; in practice, layover locations can vary throughout the day depending on the demand for available space. These costs are only meant to be illustrative.

The range of layover space required is based on varying transit vehicle ingress and egress lengths and assumed schedule efficiencies. The low estimate used the following assumptions: curbside lengths of 60 feet for FTN and peak-only service and 40 feet for coverage routes, and estimated layover times that are 20 percent of a route's cycle time or 10 minutes, whichever is greater. The high estimate assumed the following: 140 feet for FTN and peak-only services and 120 feet for coverage services, and estimated layover times were 30 percent of cycle time or 10 minutes, whichever is greater.

Note that these assumed lengths reflect variations in two factors. First, the differentiation between FTN and peak-only services and coverage routes relates to the size of the vehicles operated by each service type. The former are assumed to be 60-foot articulated coaches, while the latter are assumed to be standard 40-foot coaches. The second factor, which differentiates the low and high estimates from one another, is the amount of additional space assumed to be required to accommodate a bus in layover. The low estimate assumes the vehicle's length alone is required, while the high estimate doubles the vehicle's length to accommodate acceleration and deceleration and adds 20 feet more for ingress/egress space, which would permit queued buses to pull out and pass one another.

The range of assumed layover time reflect a more general estimation. The low estimate (20%) reflects the schedule efficiency typically used by King County Metro service planners to generate estimated costs for new routes. The high estimate (30%) adds a premium of 10 percent to reflect conditions with reduced schedule efficiency.

Draft

Figure 83 The RapidRide B Line in layover at the Bellevue Transit Center. FTN and peak-only services are assumed to operate 60-foot articulated coaches with space requirements similar to this one.

PHOTO BY John Tiscornia

Figure 84 Coverage services are assumed to operate standard 40-foot coaches similar those used by existing Route 241.

PHOTO BY John Tiscornia

Draft

SPACE REQUIREMENTS

Applying this methodology results in estimated daily maximum layover requirements—that is, the amount needed during the time of day when the most buses are in operation—ranging from 3,560 to 8,480 feet (see Table 12; for additional data see Appendix C4 on page A215). For each of the variables in this analysis, the assumed conditions are appropriate and applicable in some cases but either too conservative or excessive in others, depending on site- and service-specific needs. These estimates should therefore be interpreted as the extreme lower and upper bounds of what may be necessary, with the actual amount of layover space required falling somewhere in between. Clearly, these assumptions result in a very large range—the high estimate is more than double the low estimate.

Although, as noted, this analysis does not attempt to identify specific layover locations, it is useful to consider how these projected layover needs relate to the existing supply, both in terms of amount and location. And because the routes defined by the 2030 Growing Resource Network include terminals in other jurisdictions, it is instructive to consider the layover space implications on those cities as well, even if the Bellevue Transit Master Plan is only specifically planning for Bellevue.

Table 12 Estimated layover space required by Mobility Management Area (MMA).

Route Terminals	Low Estimate (feet)							High Estimate (feet)						
	AAM	AM	MD	PM	EVE	NITE	Daily Max.	AAM	AM	MD	PM	EVE	NITE	Daily Max.
Within Bellevue														
Downtown Bellevue	580	1,000	580	1,000	580	460	1,000	1,220	2,460	1,800	2,460	1,660	1,240	2,460
Crossroads	100	160	100	160	100	100	160	260	400	260	400	260	260	400
Eastgate P&R	300	600	420	600	300	300	600	920	1,580	1,180	1,580	1,320	920	1,580
Factoria	60	120	120	120	60	60	120	280	420	280	280	280	140	420
South Bellevue P&R	40	80	40	80	40	40	80	120	240	120	240	120	120	240
Sub-Total	***1,080***	***1,960***	***1,260***	***1,960***	***1,080***	***960***	***1,960***	***2,800***	***5,100***	***3,640***	***4,960***	***3,640***	***2,680***	***5,100***
Outside of Bellevue	580	1,600	820	1,600	700	460	1,600	1,580	3,260	2,120	3,120	2,180	1,320	3,380
Total	**1,660**	**3,560**	**2,080**	**3,560**	**1,780**	**1,420**	**3,560**	**4,380**	**8,360**	**5,760**	**8,080**	**5,820**	**4,000**	**8,480**

It is estimated that approximately 7,000 feet of layover space currently exist in the study area that includes Bellevue and portions of Redmond, Kirkland, Issaquah, Sammamish, and Mercer Island. About 2,650 feet of this are in Bellevue (see Appendix C5 on page A216). While this total might be sufficient to accommodate the projected needs in aggregate, consideration of the location of this supply suggests that adjustments will be necessary (see Figure 85, Figure 87, and Figure 88). For example, layover sites currently exist in the North Bellevue, Bel-Red/Northup, Richards Valley, and Bridle Trails MMAs; however, no routes proposed by the 2030 Growing Resources Network have terminals in these areas. Conversely, the Crossroads MMA is projected to need to accommodate between 160–400 feet of layover space in 2030, but no layover locations currently exist there. Because retention of the existing layover locations would incur inefficiencies as buses travel from their terminals to layover, it is clear that additional analysis will be required in the coming years to determine where these needs can be optimally accommodated.

Figure 85 Existing layover locations in Downtown Bellevue.

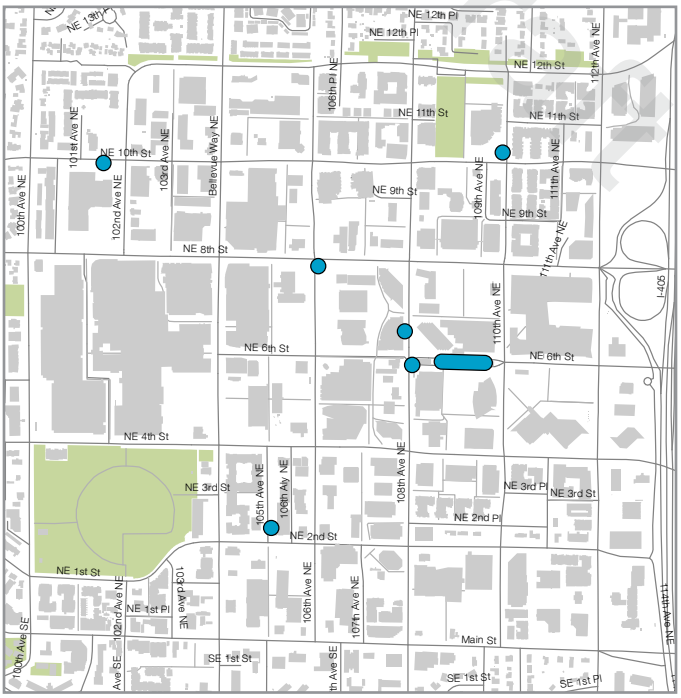


Figure 86 Existing layover supply compared to future estimated layover needs based on the 2030 Growing Resource Network by Mobility Management Area (MMA).

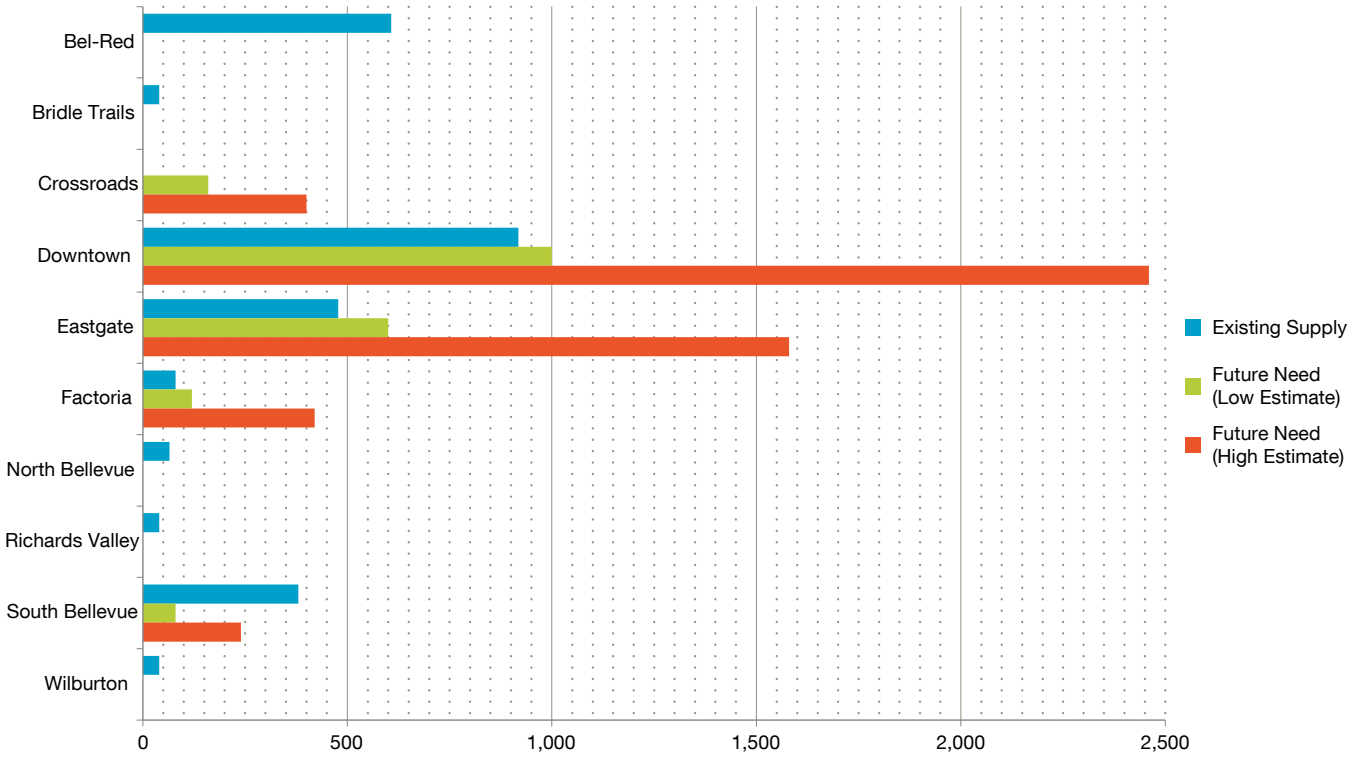


Figure 87 Bus layover needs in linear feet for the 2030 Growing Resources Network by Mobility Management Area (MMA): Low estimate.

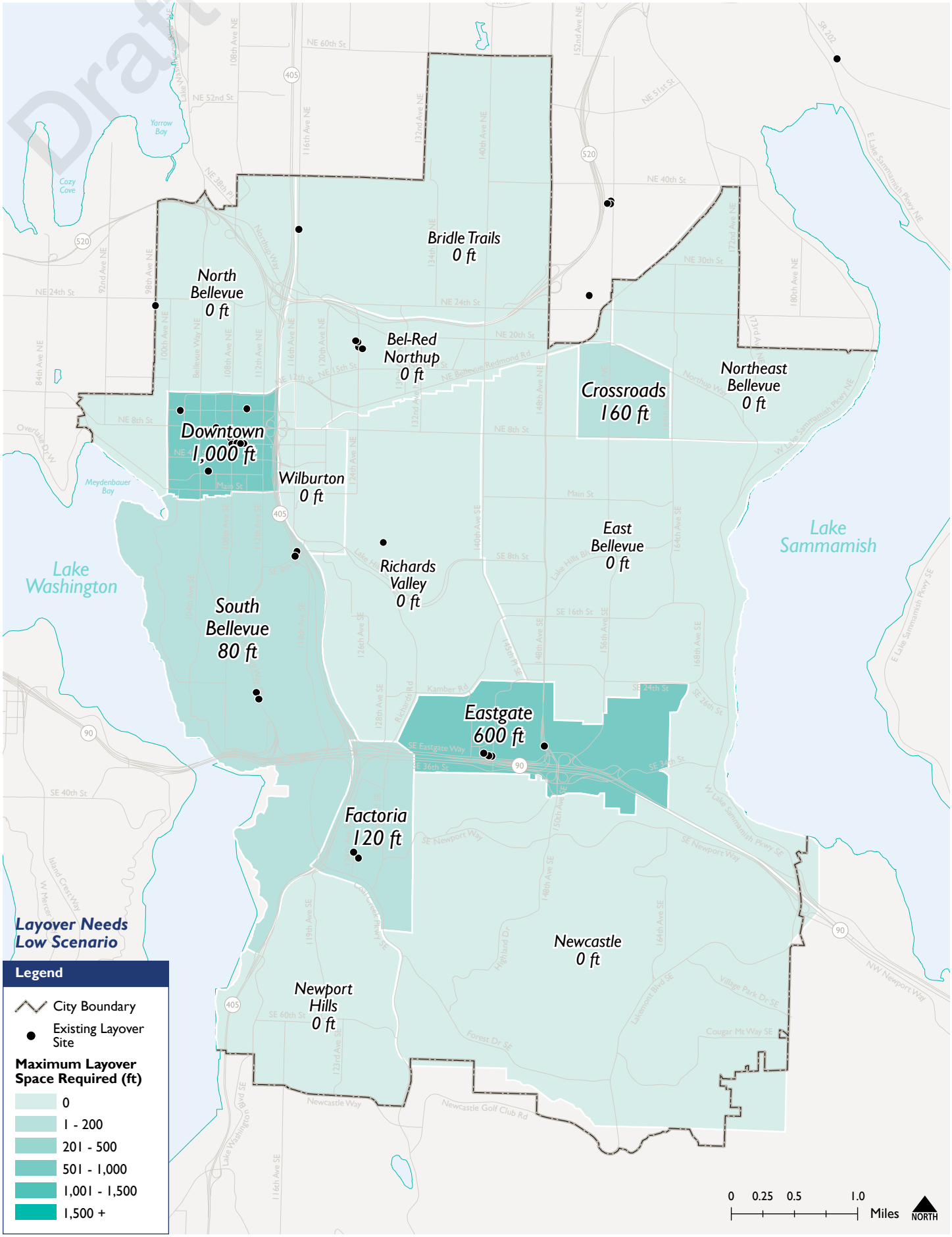
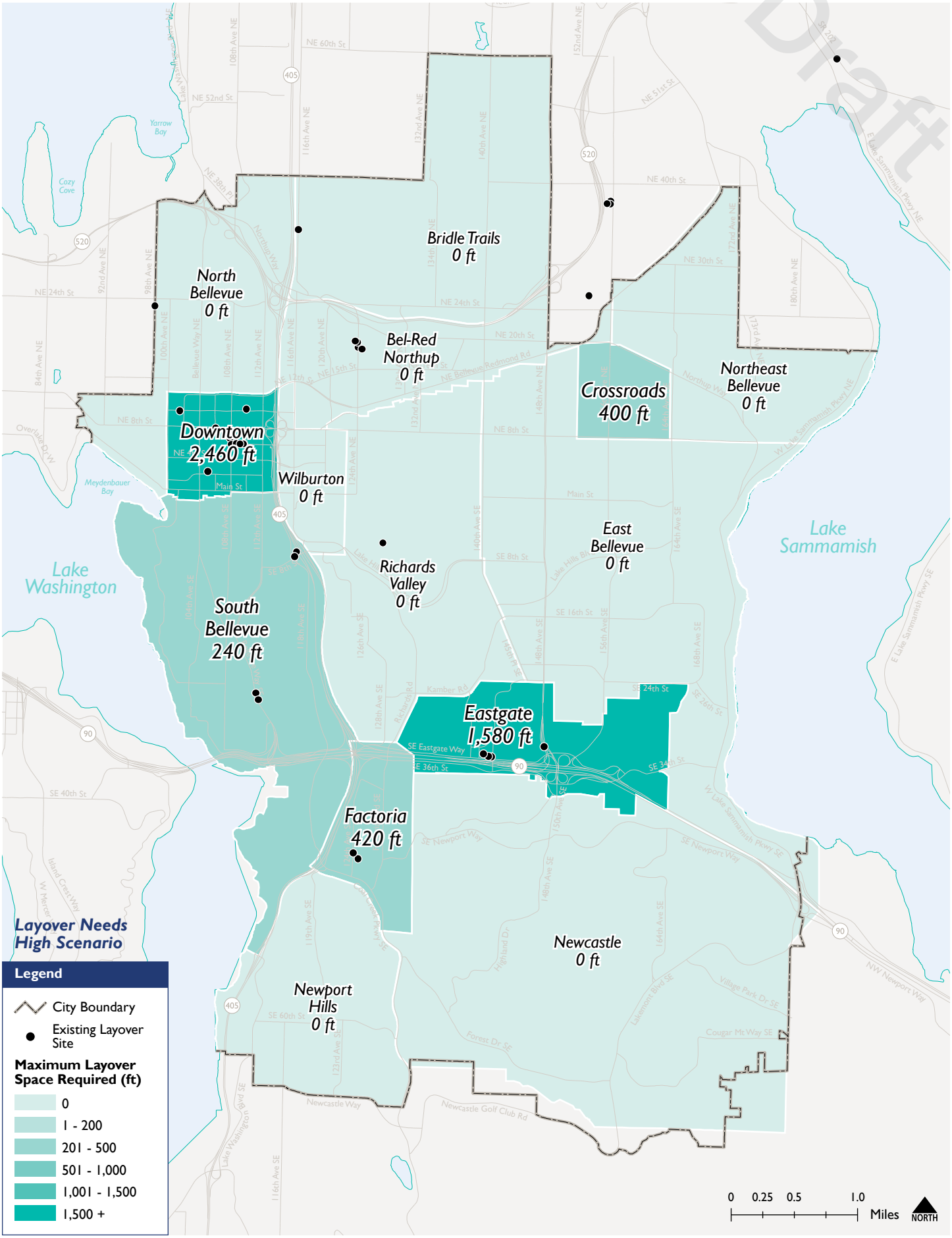


Figure 88 Bus layover needs in linear feet for the 2030 Growing Resources Network by Mobility Management Area (MMA): High estimate.



Draft

Table 13 Additional annual weekday platform hours incurred by traveling to layover locations for each route terminal in the 2030 Growing Resources Network.

Route Terminals	Total Annual Additional Weekday Platform Hours Given...	
	2-minute Terminal Access	5-minute Terminal Access
Within Bellevue		
Downtown Bellevue	15,221	36,679
Bellevue Transit Center	*9,518*	*25,098*
Bellevue Square	*2,899*	*5,716*
Old Bellevue	*2,805*	*5,865*
Crossroads	2,805	8,160
Eastgate P&R	9,648	20,804
Factoria	1,785	4,080
S. Bellevue P&R	765	957
Sub-Total	***30,224***	***70,680***
Outside of Bellevue		
Issaquah	2,856	7,523
220th Ave SE/SE 56th St	*51*	*128*
Issaquah Highlands	*1,777*	*5,971*
Issaquah Transit Center	*1,029*	*1,424*
Kirkland Transit Center	3,570	9,690
Mercer Island P&R	952	2,380
Redmond	4,786	8,479
Bear Creek P&R	*102*	*255*
Education Hill	*2,550*	*2,550*
Overlake P&R	*264*	*659*
Overlake Transit Center	*85*	*935*
Redmond Transit Center	*1,785*	*4,080*
Totem Lake	4,335	7,150
Yarrow Point Fwy Stn	1,530	2,295
Total	**48,252**	**108,196**

LOCATION IMPLICATIONS

Table 13 and Table 14 offer two different ways of considering the impacts of layover location decisions on operating efficiency. Table 13 follows the four-step methodology presented on page 86 to estimate the annual weekday cost in platform hours of locating a bus layover location 2 or 5 minutes away from the route terminal for each of the Eastside terminals served by the 2030 Growing Resources Network. That assessment indicates that between 48,000 to 108,000 annual additional weekday platform hours would be incurred, of which about 30,000 to 70,000 annual platform hours would be derived from layover locations within Bellevue.

Table 14 provides a hypothetical example that more generally illustrates the impacts of moving a layover location away from a route terminal, in this case for a route with a round trip running time of 90 minutes. Several scenarios of service frequencies and travel times to the layover location are included. The table illustrates the significance of layover location selection in a general sense to avoid complications that may arise in any given specific location. Assuming an average speed of 12 mph, the travel times shown range from 1 to 4 miles away. Figure 89 on page 95 provides a representative example of how this might be applied to routes with terminals at the Bellevue Transit Center, but it must be emphasized that the areas shown are based solely on radial distance and not meant to reflect actual travel times.

The calculations in Table 14 make several assumptions that should be noted. The additional hours shown are relative to if the route's layover location were at its terminus. Both the existing and new schedule are assumed to require 20 percent layover and recovery, which is consistent with the low estimate reflected in the terminal-based assessment. Finally, the calculations assume six hours of peak and ten hours of off-peak operation.

Draft

Any specific route would likely experience different results in a real world scenario than are shown below. However, this model provides a conceptual, planning-level illustration of the implications of layover site selection. Again, for purely illustrative purposes, we may consider the implications of the results in Table 14 on routes terminating at Bellevue Transit Center (BTC), as shown in Figure 89 on page 95. If the hypothetical route terminates at BTC, it would incur no additional annual platform hours. If the route travels

Table 14 Example of service hours impact of layover relocation.

Existing Weekday Service Levels Annual Platform Hours (90 Minute Roundtrip)						
Service Levels	*Peak Frequency*	*5*	*10*	*15*	*20*	*30*
	Off-Peak Frequency	*10*	*20*	*30*	*40*	*60*
	Baseline Annual Hours	**61,710**	**32,130**	**22,440**	**16,830**	**11,220**

Additional Annual Weekday Platform Hours Due to Change in Layover Location By Service Level						
Service Levels	*Peak Frequency*	*5*	*10*	*15*	*20*	*30*
	Off-Peak Frequency	*10*	*20*	*30*	*40*	*60*
If new layover location is...	5 Minutes Away	5,610	1,530	—	—	—
	7 Minutes Away	9,690	5,610	4,080	4,080	4,080
	10 Minutes Away	15,300	7,140	4,080	4,080	4,080
	15 Minutes Away	20,910	11,220	5,610	5,610	4,080
	20 Minutes Away	28,050	12,750	9,690	5,610	5,610

Percent Impact of Layover Relocation on Platform Hours						
If new layover location is...	5 Minutes Away	9%	5%	0%	0%	0%
	7 Minutes Away	16%	17%	18%	24%	36%
	10 Minutes Away	25%	22%	18%	24%	36%
	15 Minutes Away	34%	35%	25%	33%	36%
	20 Minutes Away	45%	40%	43%	33%	50%

Span of Service	
Peak Hours	6
Off-Peak Hours	10

Assumes existing route currently takes layover at route terminus.

Assumes existing schedule at 20% layover and recovery, new schedule at 20% layover and recovery.

Assumes existing roundtrip running time of 90 minutes.

Assumes six hours of peak and ten hours of off-peak operation.

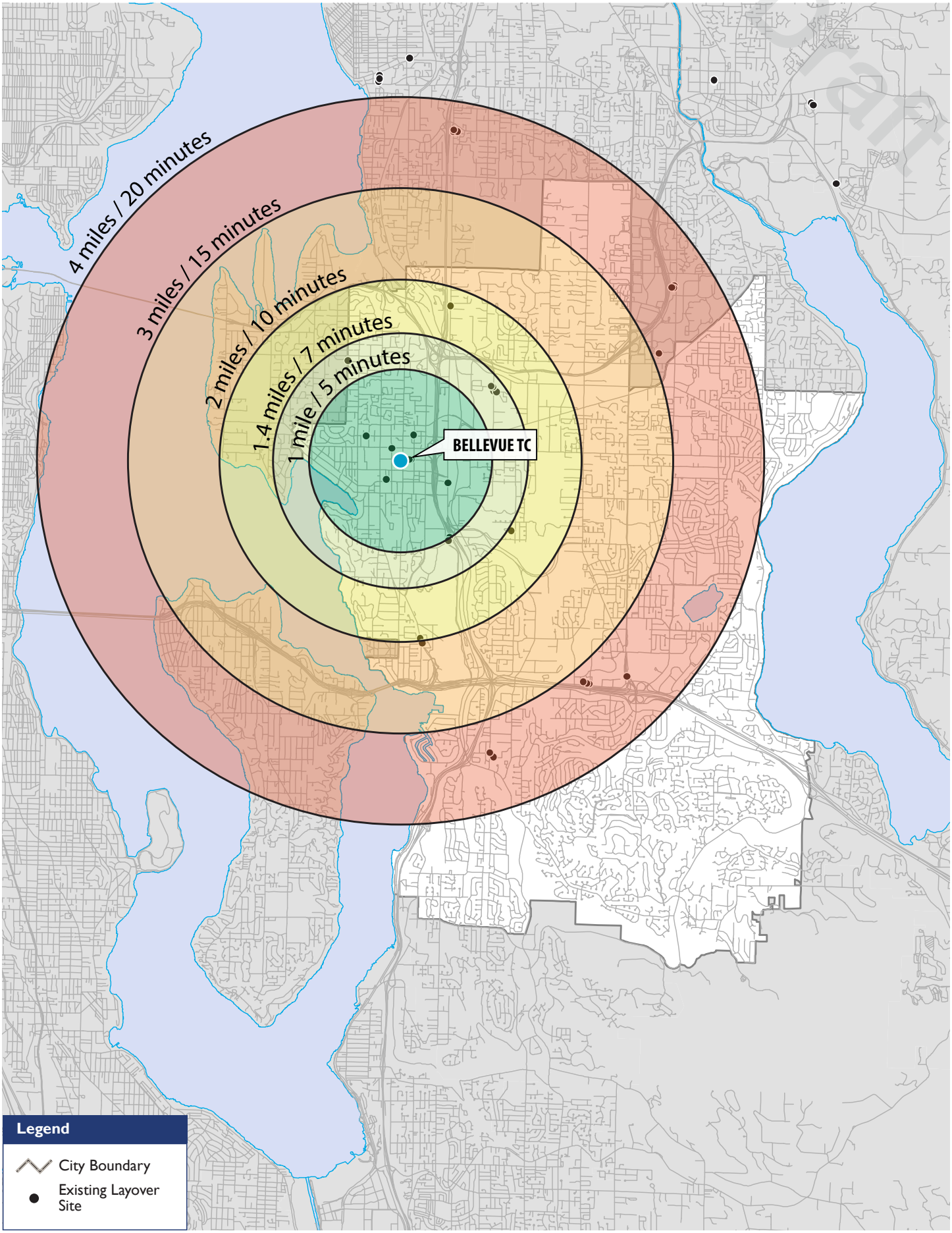
Putting Annual Platform Hours in Context		
Service hours needed to...	Fund a bus during the peak	1,530
	Fund a bus midday and evening	2,550
	Fund a bus all day	4,080

Draft

5 minutes to a layover location within the inner green circle—an area generally including Downtown and its immediate vicinity—it would incur up to roughly 5,610 additional annual weekday platform hours. This means that the process of traveling from the route terminal to its layover location, which provides no service to transit users, adds the equivalent of up to 9 percent of the route's existing total annual weekday platform hours, reducing the route's operating efficiency and wasting scarce transit resources.

It follows that the further the route must travel to reach its layover location, the more significant the loss. A route traveling from BTC to the South Bellevue Park-and-Ride on the edge of the middle yellow circle (reflecting 2 miles, or 10 minutes) would incur about 15,300 additional annual weekday platform hours, or about 25 percent more than the route's baseline annual hours. This latter hypothetical is particularly noteworthy given that South Bellevue Station is being designed with considerable bus layover accommodations, yet the South Bellevue MMA ranks fourth of five Bellevue MMAs in terms of the amount of layover space it needs to accommodate based on the number of 2030 Growing Resources routes with terminals there.

Figure 89 Bus layover needs in linear feet by Mobility Management Area (MMA): Conservative (low) estimate.



Draft

Draft

This page intentionally left blank.

Draft

SECTION 4:
TRANSIT RUNNING WAY

Draft

BACKGROUND

According to respondents of Bellevue's Transit Improvement Survey, improving service speed and reliability by investing in roadway and traffic signal infrastructure is the highest priority for municipal investment in transit among current transit users in Bellevue (see Figure 90). Building from an extensive market analysis, review of future growth patterns, and evaluation of transit needs, the City of Bellevue's Transit Master Plan (TMP) identifies specific capital projects that will improve transit speed and reliability in high ridership bus corridors. This task, identified as the Capital Element in the TMP scope of work, has three primary objectives:

1. Stimulate discussion on congestion in Bellevue that compromises transit's efficiency.
2. Evaluate the trade-offs associated with different street design decisions.
3. Assess roadway, signal system, and other right-of-way improvements that could be made to support the 2030 Frequent Transit Network outlined in the Service Vision Report.

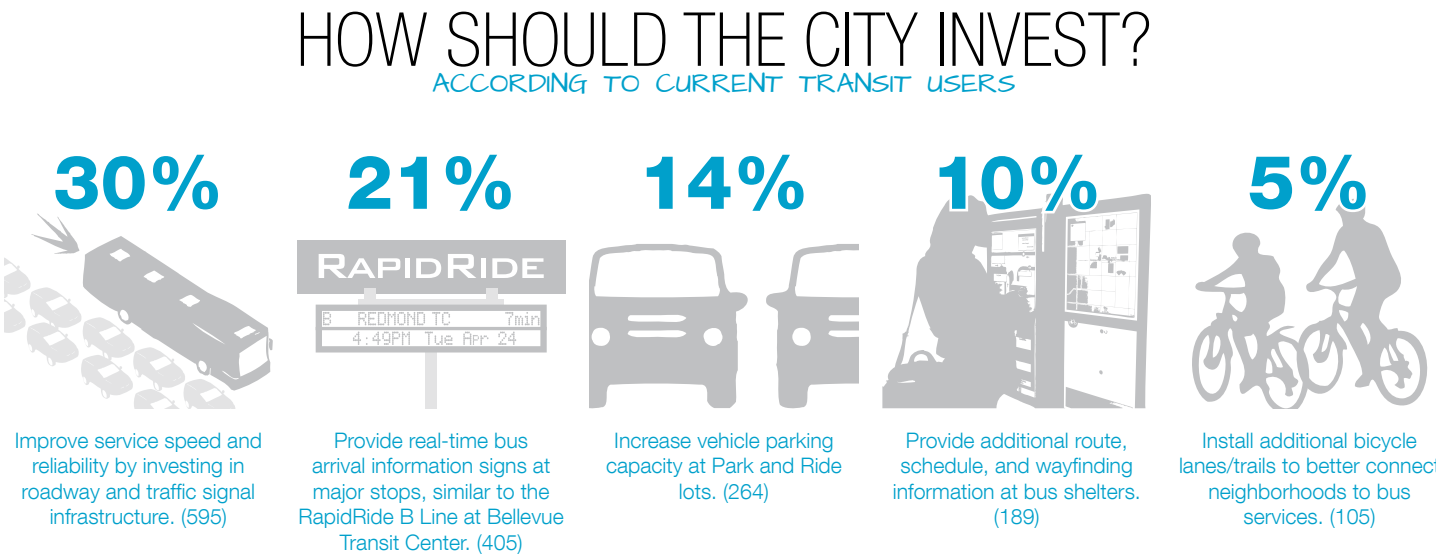


Figure 90 The most common way current transit users think the City should invest municipal resources to improve transit service in Bellevue is by "improving service speed and reliability by investing in roadway and traffic infrastructure" (30.3%; 595/1,962). The above are the five strategies most commonly selected by respondents to the 2012 Transit Improvement Survey. For full results, see the *Bellevue Transit Improvement Survey Report*.

Draft

For the purposes of assessing potential capital projects, the Capital Element references the 2030 Frequent Transit Network (FTN) as proposed in the *Transit Service Vision Report* (see Figure 1 on page iv and Figure 2 on page 2). This network is comprised of all frequent services operating in the 2030 Growing Resources scenario, which increases service by approximately 47 percent from Spring 2012 levels to accommodate the projected near tripling of citywide transit demand by 2030. This is both the vision to which the City aspires and that with the greatest number of buses in operation—and hence that with the greatest need for capital investments to support fast and reliable service. The FTN supports Downtown growth, planned Bel-Red corridor redevelopment, and Bellevue's other activity centers with well-connected bus routes that seamlessly interface with East Link light rail. People traveling along FTN corridors can expect convenient, reliable, easy-to-use services that are so frequent, riders will not need to refer to a schedule when using these routes or connecting to East Link.

As part of the ongoing outreach supporting the TMP, the Transportation Department held the joint Board/Commission Capital and Policy Workshop on September 6, 2013. Workshop participants engaged in a discussion about the appropriate degree to which transit should be given priority over other modes—if at all—and in which situations. This was considered both in terms of the language used in City policies and in relation to transit priority treatments along Frequent Transit Network corridors. Refer to the *Capital & Policy Workshop Report* for additional information.

Although the Capital and Policy Workshop represented only an initial step in the capital planning process, the perspectives expressed and insights gleaned from it prompted numerous rounds of

Figure 91 Boards and Commission members provide their perspective on potential transit priority policy language and treatment options.

Draft

staff consultation, field assessment, and technical evaluation. On November 14, 2013 Bellevue staff published the *Draft Capital Element Background Report (Volume 1: Speed and Reliability)*, which addressed each of the following:

1. **Past Studies** – Summary of notable previous studies conducted since the adoption of the 2003 Bellevue Transit Plan. See pages 102 through 106 of this report.
2. **Toolbox of Corridor Treatments** – A review of best practices compiled into a toolbox of speed and reliability treatments to guide capital improvements along FTN corridors. See pages 107 through 121 of this report.
3. **Speed & Reliability Issue Identification** – Evaluation methodology used to determine where it might be appropriate for Bellevue to consider investing in capital projects along FTN corridors. See pages 122 through 143 of this report.
4. **Potential Improvements** – A preliminary list of potential speed and reliability improvements for each of the FTN corridors. See pages 53 through 77 of the Draft Report. (The current list of projects being proposed is presented on pages 145 through 173 of this report.)
5. **Projected Outcomes** – Assessment of potential speed and reliability improvements on transit and general purpose travel speeds. See pages 175 through 179 of this report.

Preliminary project descriptions and visualizations provided Transportation Commissioners and other interested stakeholders with an opportunity to review and comment on the potential improvements being considered. Over the course of several Commission meetings, staff responded to requests for additional

information on many of the projects contained in the Draft Report. In some cases, these requests prompted detailed micro-simulation traffic model analysis (see Appendix D5 on page A252). During this evaluative stage, a number of suggested projects were eliminated from further consideration due to one or more 'fatal flaws' that were identified, but these projects are included for reference in this document in Appendix D8 (see page A298).

The current list of speed and reliability improvements is based on months of technical review and input from the Transportation Commission (see pages 145 through 173). Still, these projects remain conceptual, and the final details of design will be developed as the projects proceed further along in the implementation process.

Draft

Draft

PAST STUDIES

The first task of the Capital Element was the documentation of previously identified transit and roadway improvements along the corridors served by the Frequent Transit Network (FTN). The following provides a brief summary of the reports referenced.

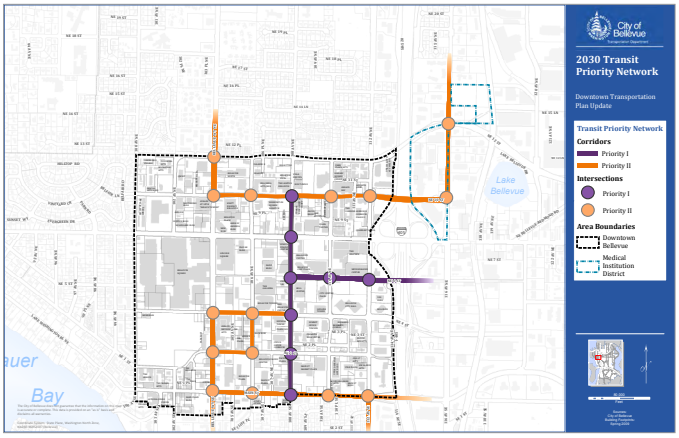


Figure 92 The 2030 Transit Priority Network from the *Downtown Transportation Plan Update*.

Downtown Transportation Plan Update (current) – This on-going project will be a focused update to the transportation portion of the Downtown Subarea Plan, which was adopted in 2004. The update will incorporate forecasted growth in population and employment through 2030 to ensure that the Downtown transportation system can function well and support this anticipated growth. A multimodal strategy is being pursued to accommodate both motorized and non-motorized transportation demand. The final report will include a revised list of system improvements to roadways, transit, pedestrian and bicycle facilities, and traffic signal operations. While still on-going, some early results of this effort relating to the Transit Master Plan include the establishment of future transit circulation patterns in Downtown, which are reflected in the networks proposed in the *Transit Service Vision Report*, and the consideration of projects such as the 108th Ave NE Bus Priority Corridor.

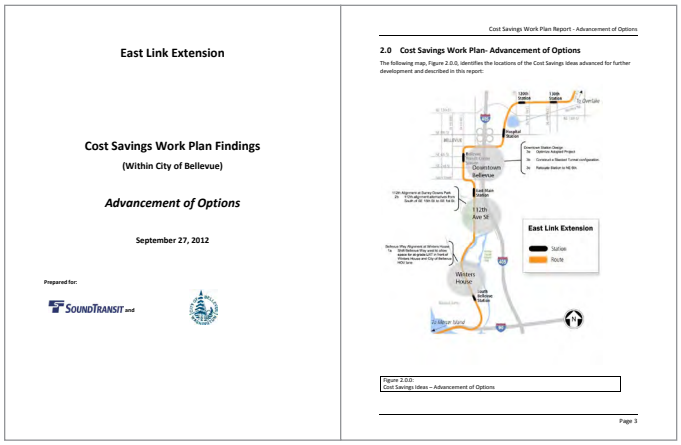


Figure 93 Map of the three areas with cost savings options advanced for further consideration, from the *East Link Extension Cost Savings Work Plan Findings.*

East Link Extension Cost Savings Work Plan Findings (2012) – Following the November 2011 execution of a Memorandum of Understanding (MOU) regarding funding and construction of East Link light rail, the City of Bellevue and Sound Transit analyzed cost savings concepts that have the potential to save at least $60 million in project costs while supporting the system's performance. This report summarizes the cost savings options advanced for further development, including alternative alignments for Bellevue Way and 112th Ave SE segments and several

Draft

options for the Downtown Station design. The review of each of these includes anticipated cost savings, impacts to traffic, vehicle and pedestrian access, noise, visual appearance, and any impacts to adjacent properties, wetlands, and parks. Other projects are associated with these concepts, including a southbound HOV lane along Bellevue Way SE between 112th Ave SE and South Bellevue Park-and-Ride.

Eastgate/I-90 Land Use and Transportation Project (2012) – The *Transportation Strategy Report* outines a vision that will guide public and private actions, investments, and capital project priorities to improve mobility for all travel modes in the Eastgate/I-90 corridor. Potential improvements advanced by the plan are oriented toward finding the best transportation solutions for the area that are affordable, supported by the community, and can be implemented in a reasonable time frame. The list includes projects that would improve traffic flow at critical intersections, enhance the pedestrian/bicycle environment, and increase the attractiveness of transit as a travel option. One of the transit improvements proposed is the development of 142nd Pl SE as a transit emphasis corridor, including upgrading Snoqualmie River Rd to support buses and accessible bus stops.

SR-520 High-Capacity Plan (2008) – The *SR-520 High Capacity Transit Plan* outlines a strategy for meeting the demand for cross-lake travel with an incremental implementation of bus rapid transit service that connects employment, residential areas, and activity centers on both sides of Lake Washington. The plan recommends how transit can build on capital investments identified for the SR-520 Corridor Program by substantially increasing service and improving off-

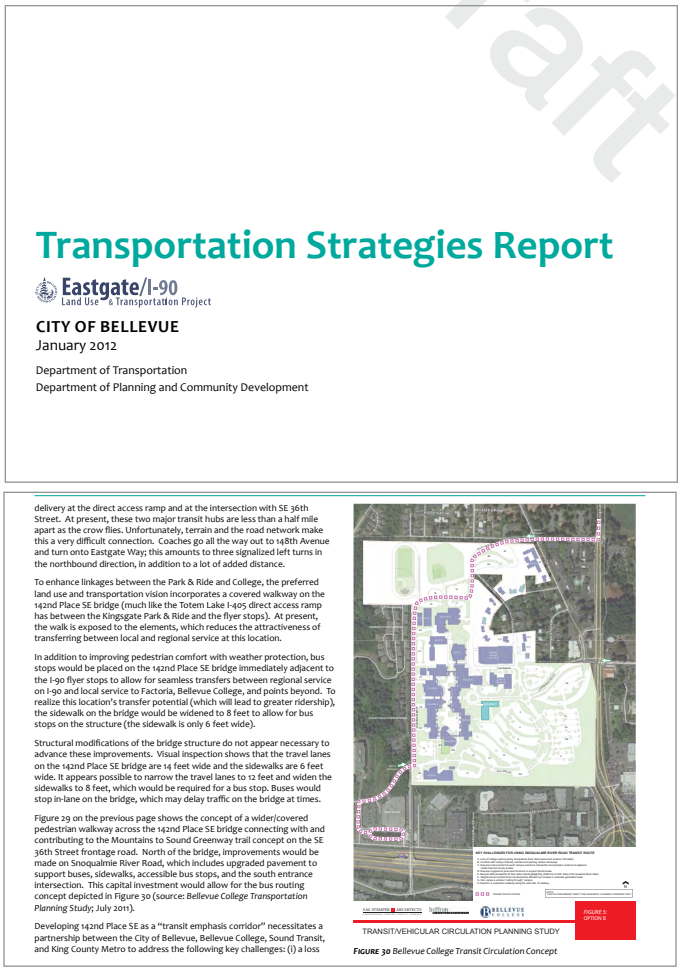


Figure 94 Proposed improvements and revised transit routing around Bellevue College along Snoqualmie River Rd, from the *Eastgate/I-90 Transportation Strategies Report*.

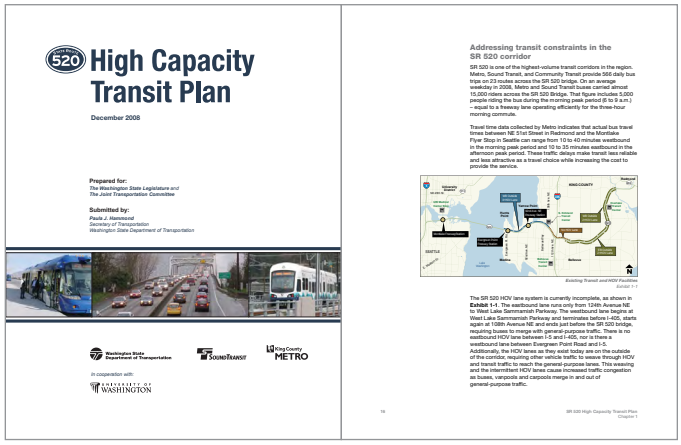


Figure 95 A map depicts the existing transit and HOV facilities on SR-520, from the *SR-520 High-Capacity Plan*.

Draft

corridor transit facilities to help meet future growth in travel. Of the plan's three major elements, that most relevant to the TMP is the near-term implementation of bus rapid transit service on SR-520 supported by HOV lanes and direct-access ramps, transit priority treatments at intersections, intelligent transportation systems (ITS), and improvements in fare collection systems and bus stations.

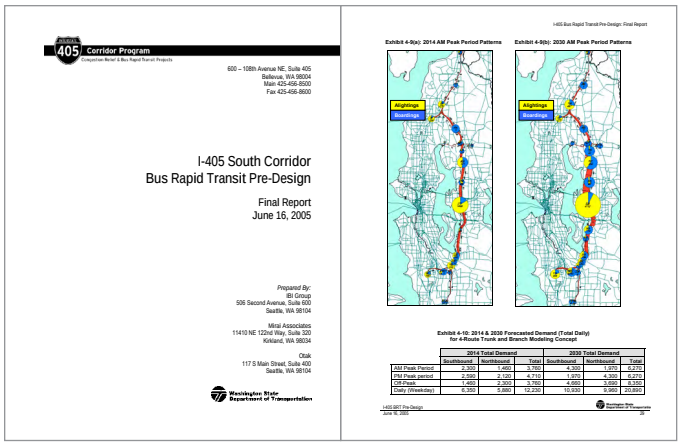


Figure 97 Maps depict I-405 BRT stop-level ridership forecasts for the AM peak period in 2014 and 2030, from the *I-405 Corridor Program: Bus Rapid Transit Line Concept.*

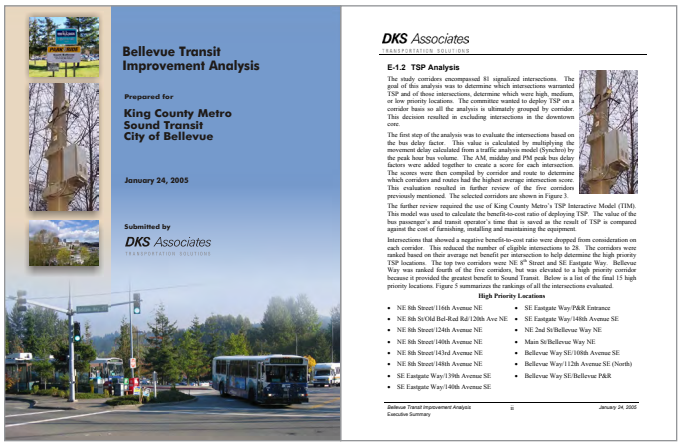


Figure 96 Summary of the TSP analysis process and the fifteen highest-ranked intersections prioritized for transit signal priority (TSP), from the *Bellevue Transit Improvement Analysis*.

I-405 Bus Rapid Transit Concept Reports – Several reports related to I-405 Corridor BRT planning were reviewed to help inform the TMP Capital Element, including *White Paper: I-405 Bus Rapid Transit Line Concept* (2003) and the *I-405 South Corridor Bus Rapid Transit Pre-Design Report* (2005). The former describes components of the proposed BRT line for the entire I-405 corridor, including HOV lanes, direct access ramps, BRT station locations and designs, fare collection, ITS, and other features. It also presents ridership forecasts for the corridor with and without implementation of the BRT line and estimates the cost of the various infrastructure investments considered by the plan. The latter report builds on earlier I-405 Corridor studies, focusing on the the southern portion of the corridor from Bellevue to Sea-Tac Airport. It assesses the overall feasibility of operating BRT along this section of the corridor in the short- (2014) and long-term (2030), considers current travel times and sources of delay, and identifies infrastructure needed to support BRT operations along with planning-level cost estimates.

Bellevue Transit Improvement Analysis (2005) – In April of 2004, King County Metro, Sound Transit, and the City of Bellevue collaborated to consolidate all of the proposed transit improvements in Bellevue from various prior studies and to identify immediate transit needs. This report summarizes the results of the arterial improvement evaluation and TSP analysis. The goal was to identify routes and corridors with

the greatest needs based on a qualitative review of headways, ridership, and historic delay problems. The primary corridors identified include NE 8th St, 156th Ave NE, Bellevue Way, Eastgate Way, and Factoria Blvd. King County Metro's TSP Interactive Model (TIM) was used to calculate the benefit-to-cost ratio of deploying TSP, wherein the value of the bus passenger's and transit operator's time saved is compared to the cost of furnishing, installing, and maintaining the equipment. Of the 81 signalized intersections originally assessed, most were removed from further consideration on the basis of negative benefit-to-cost ratios, leaving 28 eligible intersections. The fifteen highest ranked locations were estimated to cost $543,000 to furnish and install equipment.

ITS Master Plan (2004) – The Bellevue ITS Plan is a road map to implement an integrated system of transportation strategies based on a set of identified opportunities. The plan's purpose is to establish the need for ITS investments in the region, to identify relative priorities to direct ITS investment, to identify specific projects to be deployed to address identified needs, and to prioritize financial resources for ITS opportunities. The plan was coordinated with regional efforts to ensure that ITS strategies are integrated and complementary, which helps ensure that Bellevue is eligible for federal ITS funding. Among the projects identified is a collaborative evaluation with Metro of the potential to deploy TSP at up to 120 along six of Bellevue's most heavily traveled transit routes, which would be implemented over twenty years.

Factoria Area Transportation Study Update (2005) – This report is an update to the 1996 *Factoria Area Transportation Study*, which was completed three years after the area annexed to Bellevue. The update documents the transportation system capacity analysis that was conducted, addresses the needs of all modes of transportation within

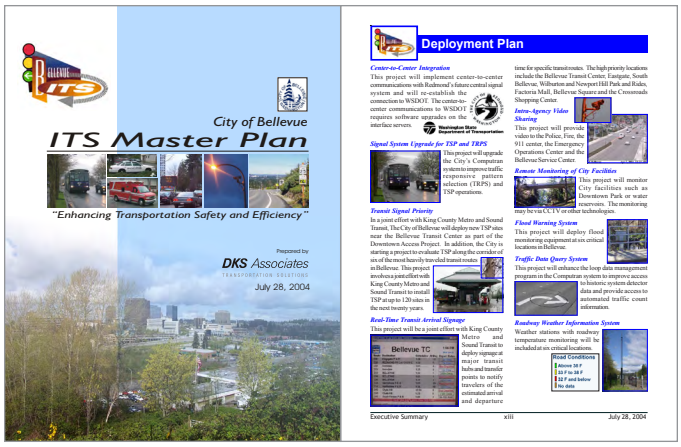


Figure 98 High priority projects identified by the *ITS Master Plan.*

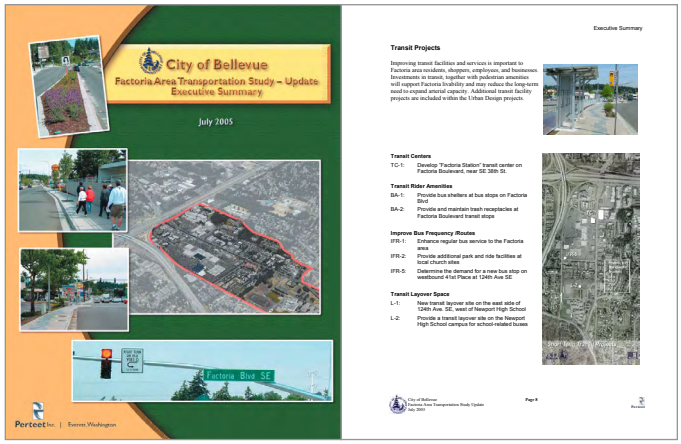
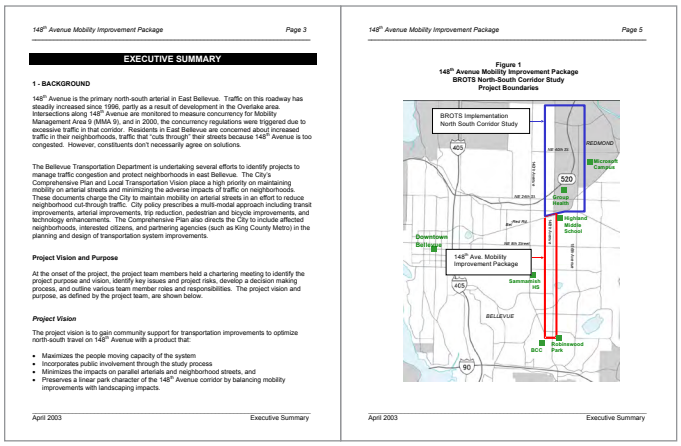


Figure 99 Transit facilities and service improvement projects identified by the *Factoria Area Transportation Study.*

Draft

Draft

the area, and provides design guidance for private sector redevelopment along Factoria Blvd. Further, the update provides a strategy to achieve long-term mobility and safety for all transportation system users. It challenges the existing, disconnected suburban land use pattern, providing transportation and urban design recommendations embraced by the community that would create a well-integrated, transit supportive, pedestrian oriented, mixed-use urban neighborhood.



148th Avenue Mobility Improvement Package — Page 3

EXECUTIVE SUMMARY

1 - BACKGROUND

148th Avenue is the primary north-south arterial in East Bellevue. Traffic on this roadway has steadily increased since 1996, partly as a result of development in the Overlake area. Intersections along 148th Avenue are monitored to measure concurrency for Mobility Management Area 9 (MMA 9), and in 2000, the concurrency regulations were triggered due to excessive traffic in that corridor. Residents in East Bellevue are concerned about increased traffic in their neighborhoods, traffic that "cuts through" their streets because 148th Avenue is too congested. However, constituents don't necessarily agree on solutions.

The Bellevue Transportation Department is undertaking several efforts to identify projects to manage traffic congestion and protect neighborhoods in east Bellevue. The City's Comprehensive Plan and Local Transportation Vision place a high priority on maintaining mobility on arterial streets and minimizing the adverse impacts of traffic on neighborhoods. These documents charge the City to maintain mobility on arterial streets in an effort to reduce neighborhood cut-through traffic. City policy prescribes a multi-modal approach including transit improvements, arterial improvements, trip reduction, pedestrian and bicycle improvements, and technology enhancements. The Comprehensive Plan also directs the City to include affected neighborhoods, interested citizens, and partnering agencies (such as King County Metro) in the planning and design of transportation system improvements.

Project Vision and Purpose

At the onset of the project, the project team members held a chartering meeting to identify the project purpose and vision, identify key issues and project risks, develop a decision making process, and outline various team member roles and responsibilities. The project vision and purpose, as defined by the project team, are shown below.

Project Vision

The project vision is to gain community support for transportation improvements to optimize north-south travel on 148th Avenue with a product that:

- Maximizes the people moving capacity of the system
- Incorporates public involvement through the study process
- Minimizes the impacts on parallel arterials and neighborhood streets, and
- Preserves a linear park character of the 148th Avenue corridor by balancing mobility improvements with landscaping impacts.

April 2003 — Executive Summary

148th Avenue Mobility Improvement Package — Page 5

Figure 1
148th Avenue Mobility Improvement Package
BROTS North-South Corridor Study
Project Boundaries

April 2003 — Executive Summary

Figure 100 Project extents assessed by the *148th Avenue Mobility Improvement Package.*

148th Avenue Mobility Improvement Package (2003) – This study addresses the concerns of residents of East Bellevue neighborhoods, who were concerned that excessive traffic in the 148th Ave corridor was resulting in increased traffic on neighborhood streets. The project's vision is to gain community support for transportation improvements to optimize north-south travel on 148th Ave that maximizes the people-moving capacity of the system while minimizing the impacts on parallel arterials and neighborhood streets. The report identifies short- and mid-term projects to manage congestion problems and protect neighborhoods from cut-through traffic. Some transit projects recommended include TSP at slected locations along 148th Ave and a southbound queue jump at SE 24th St.

TRANSIT PRIORITY TOOLBOX

Draft

The Transit Priority Toolbox includes a range of transit priority treatments being considered for implementation on Bellevue's transit corridors by 2030. The purpose of the toolbox is to guide capital improvements on Frequent Transit Network (FTN) corridors that will improve the speed and reliability of these services—both to make them more attractive to the public, and to ensure they achieve operating speeds consistent with estimates in the *Transit Service Vision Report*.

Treatments considered in the Transit Priority Toolbox are generally divided into three categories: intersection treatments, bus stop treatments, and running way treatments. Each category includes strategies with different levels of financial investment, degrees of benefit to transit, and impacts to other travel modes. Some improvements are intended for discrete locations, while others are meant to be coordinated along entire corridors. Some locations or corridors may warrant multiple improvements based on existing configurations and the level of transit priority deemed appropriate. Figure 101 provides a graphical summary of the treatment types organized according to the degree of transit operational exclusivity they provide.

All treatments that grant transit priority are based on the principle that streets are owned by all citizens and should thus be managed for the maximum movement of people, not necessarily of vehicles. Thus, if fewer vehicles can move more people in less space, it may be appropriate to grant priority to such vehicles in certain situations. The following pages describe each of the treatments being considered, their advantages, disadvantages, and approximate cost, and include photographs of their application elsehwere in the Puget Sound region.

Intersection treatments are spot improvements that include transit signal priority (TSP), queue jump lanes, and left turn restrictions.

Bus stop treatments refer to the various configurations that can be used with respect to the relationship between stops and travel lanes, including in-lane stops, curb extensions, and transit islands.

Running way treatments are improvements implemented along the length of a street segment that include BAT lanes, arterial HOV lanes, transit-only lanes or streets, contra-flow bus lanes, and busways.

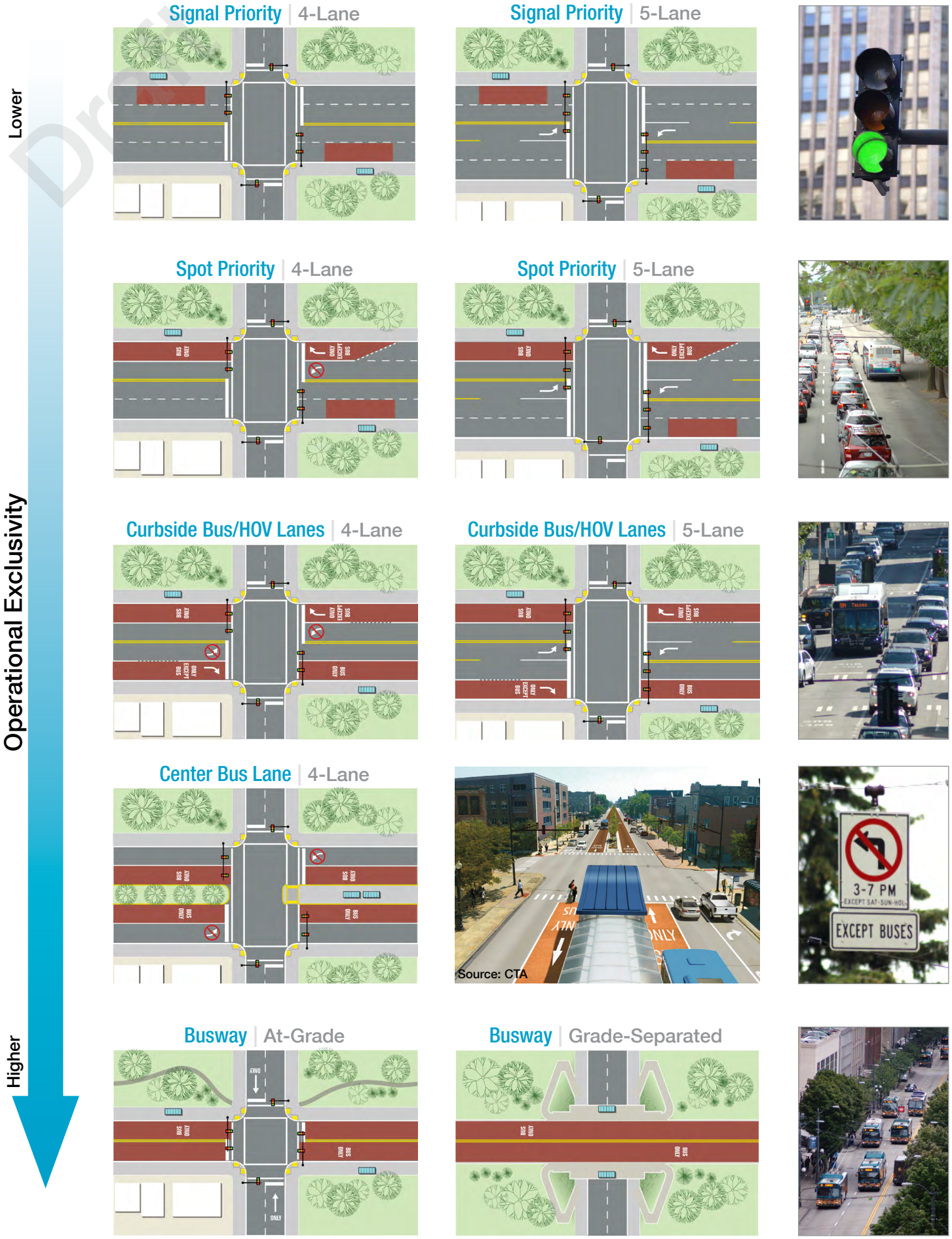


Figure 101 Diagram of the level of operational exclusivity exhibited by the primary categories of treatments in the Transit Priority Toolbox.

Draft

Transit Signal Priority

Description

Transit signal priority (TSP) is an operation that adjusts signal timing to prioritize transit vehicle movements along a corridor. There are several types of signal priority treatments, as shown at left, with green extension and early green used most commonly. Intersection context and city policy have a significant impact on the speed and reliability benefits that TSP can provide to transit. Arterials with medium levels of congestion and frequent signalized intersections are ideal for TSP. Many other priority treatments are paired with TSP to improve overall effectiveness.

Passive TSP strategies include signal timing coordination and the addition of a special signal phase. Active TSP offers the additional ability to give a bus priority conditionally based on one or more factors, including whether a bus is running late, the number of passengers on board, and how recently priority was given to another bus. Upgrades to signal controllers and fiber communication lines are often necessary for implementation of active TSP strategies.

Green Extension – This application keeps a signal green for an approaching bus until the bus has passed through an intersection.

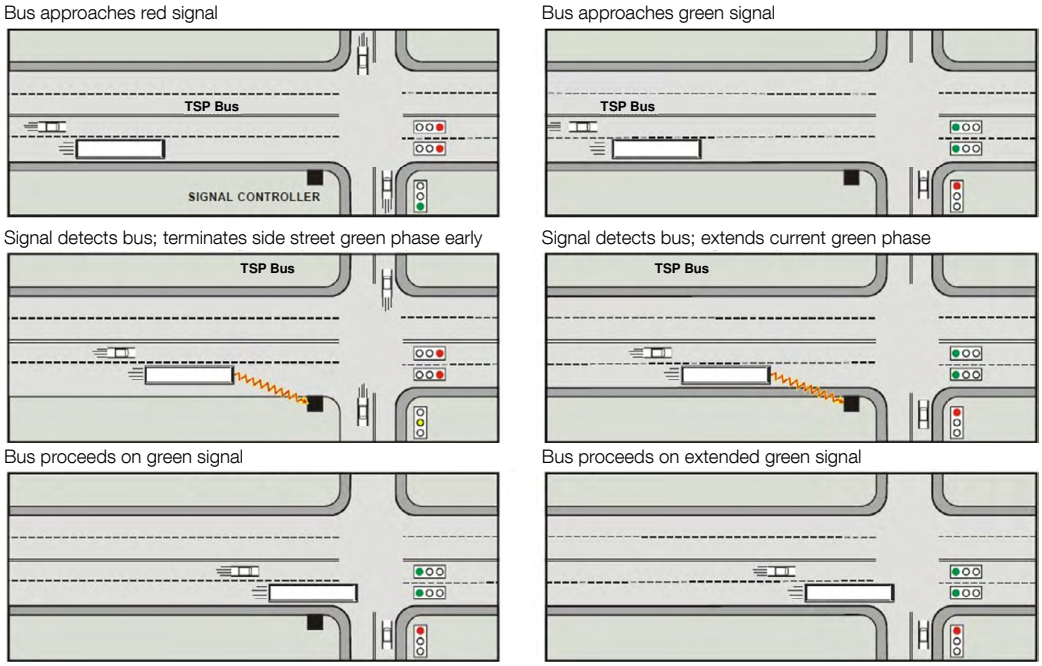
Early Green (Red Truncation) – This application reduces the amount of time a bus waits for a green light by shortening the amount of green time given to other traffic.

Phase Rotation – This application switches the sequence in which signals turn green, most commonly switching a left turn arrow with a through green for an approach.

Pre-emption – This application is typically used by emergency vehicles and at railroad crossings. Designated vehicles receive a green signal upon approaching an intersection or crossing.

Special Phase – This application is used to give a green light to a bus only signal when a bus is present. This type of application is typically used at or near transit centers when buses make unusual movements through an intersection.

Figure 102 Signal timing operations with early green (left) and green extension (right).



Source: URS for Pace Suburban Bus (2011).

Draft

Figure 103 Transit signal priority helps to ensure that buses can move along a corridor with minimal delay incurred by red lights.

Advantages

- Provides modest speed and reliability improvement
- Improves overall travel time between three to fifteen percent and can reduce signal delay for transit up to 75%
- No additional right-of-way required
- Produces a minimal overall impact to general traffic, depending on the level of priority assumed
- Can be implemented with other signal and transit enhancements

Considerations

- Performance depends on many factors including:
  - Number of intersections
  - Priority thresholds
  - Extent of priority
- TSP has limited impact when buses are on highly congested corridors
- May disturb the flow of a coordinated signal system
- Requires inter-jurisdiction coordination
- Side-street bus routes may experience additional delay when favored routes receive priority
- Not as effective with far side stops

Queue Jump Lanes

Description

Queue jumps allow buses to bypass congested choke points through a combination of a short bus-only lane and a dedicated bus signal, which gives buses a green light several seconds before other vehicles. This operation allows buses to enter the intersection ahead of general traffic. Queue jumps are primarily used when the right-of-way at a choke point is constrained, but roadways leading up to the choke point have sufficient space for a dedicated bus-only lane.

Figure 104 A bus approaches an intersection in a bus-only queue jump lane.

Benefits

- Allows buses to bypass congestion at critical locations
- Requires less right-of-way than treatments along a full corridor
- Can improve bus travel time by five to twenty-five percent and reduces delay

Considerations

- Impacts to general purpose traffic varies per improvement strategy (i.e. use of a right-turn lane or conversion of second thru-lane to a right-turn only lane with transit queue jump)
- Effectiveness will vary depending on location of intersection transit stop
- Will be less effective with high volume right-turn lanes

Figure 105 The bus-only queue jump lane (right signal) receives a green signal before general purpose traffic (left signal).

Draft

Figure 106 Left turn restriction on general purpose traffic.

Figure 107 A bus turns during a protected phase.

Left Turn Restrictions

Description

Turn restrictions are generally used to improve safety or reduce congestion by restricting left-turns during peak periods. In many cases, turn restrictions reduce delays caused by turning vehicles blocking traffic. This is primarily an issue at intersections without dedicated left-turn lanes, such as 2-lane and 4-lane corridors. Turn restrictions are also used in combination with transit priority treatments. A turn restriction maximizes the capacity of the remaining general purpose lanes or restricts unsafe movements that cross bus traffic. Turn restrictions may also give transit priority at locations with heavy traffic delays.

Benefits

- Improves traffic operations at intersections and along corridors where center turn lanes do not exist
- Can be implemented for specific time periods
- Provides priority for transit vehicles when turning left
- Improves travel time for transit

Considerations

- Can cause confusion for general traffic
- Reduces route options for general purpose traffic during peak periods
- Requires active enforcement
- May increase intersection delays caused by vehicle diversion, degrading intersection levels of service
- Can impact safety at adjacent intersections through the consolidation of left-turning traffic

Draft

In-Lane Bus Stops

Description

In-lane bus stops are locations where a bus stops in a travel lane to pick-up or drop-off passengers. This type of stop typically generates less delay for the bus as compared to bus pullouts, which require the bus to leave the traffic stream and re-enter after serving passengers. Merging back into the main travel lane can significantly delay buses because passenger vehicles often do not yield to a bus attempting to merge into traffic. This causes additional delay and increased potential for conflicts. In-lane stops reduce re-entry delay and increase safety for the bus and other vehicles. In-lane bus stops are particularly effective on roadways with few gaps in traffic.

Figure 108 RapidRide bus at an in-lane bus stop.

Benefits

- Reduces re-entry delay after serving a bus stop
- Increases transit visibility

Considerations

- Increases vehicle delays for general traffic (may vary with one or two lane directional configurations)
- Can increase bike/transit conflicts

Figure 109 Unlike bus pullt-outs, in-lane stops do not incur delay by requiring buses to re-enter the traffic stream.

Draft

Curb Extensions

Figure 110 Curb extension on the far-side of an intersection.

Description

Curb extensions are locations where the sidewalk has been extended to allow buses to stop in-lane. This design reduces delays for buses by avoiding re-entry delay, with the added benefit of providing additional sidewalk space for waiting passengers and amenities. Curb extensions are typically used in locations were on-street parking is provided; buses experience delay when re-entering traffic; or additional sidewalk space is needed. Roadway capacity may be reduced, and conflicts between bikes and transit might occur in situations where bicycle lanes exist.

Benefits

- Reduces re-entry delay after serving bus stop
- Allows for retention of on-street parking or load zones
- Increases pedestrian comfort by allowing for wider sidewalks and bus stop amenities
- Can improve pedestrian safety by reducing crossing distance if incorporated into a mid-block crosswalk or intersection treatment

Figure 111 Curb extension following a short parking lane.

Considerations

- Increases vehicle delays for general traffic (may vary with one or two lane directional configurations)
- Can increase bike/transit conflicts

Draft

Transit Boarding Islands

Description

Transit islands provide a bus stop in the road right-of-way separated from the curb through a variety of designs. This treatment enables a bus to travel and stop in a lane that is not adjacent to the curb while still providing amenities to the transit riders. For example, buses may use the left lane of a roadway because of a priority treatment or a necessary maneuver, and a transit island allows buses to serve a bus stop without changing lanes. Transit islands can also reduce bike and transit conflicts by routing the bicycle lane behind the transit island. Transit islands are built within the street right-of-way and often reduce effective crossing distances for pedestrians, which may improve pedestrian connectivity and safety.

Figure 112 Transit island with in-lane bus stop.

Benefits

- Integrates with locations configured with a left side transit lane
- Reduces transit vehicle re-entry delay after serving a bus stop
- Reduces bike/transit “leap-frog” conflicts
- Can be useful at intersections with significant parking activity and right turns

Figure 113 Transit island with bus-only lane.

Considerations

- Increases vehicle delays for general traffic, particularly if unable to pass the bus
- Requires space within standard street ROW
- Could create an unsignalized pedestrian crossing for riders to access the transit island, if configured mid-block

Draft

Figure 114 Transit island with in-lane bus stop.

Figure 115 Transit island with bus-only lane.

Business Access & Transit Lanes

Description

Business Access and Transit (BAT) Lanes restrict a curbside lane of a multilane arterial to transit and right-turning vehicles only. At intersections, all vehicles (including high occupancy vehicles) are required to turn right while transit can continue straight through the intersection. This preserves access to businesses and side-streets, but reduces vehicle volumes in the curbside lane such that transit speed and reliability are improved. BAT lanes may not benefit transit operations well in locations with frequent right-turn vehicle movements and heavy conflicting pedestrian volumes.

Benefits

- Can result in significant transit speed and reliability improvements through congested corridors where standing queues from intersections increase congestion
- Works well in locations with infrequent right turn movements

Considerations

- Requires significant ROW to construct or conversion of travel or parking lane to BAT lane
- Can increase general purpose congestion through decreasing general purpose capacity
- Can be blocked by cyclist or turning/merging vehicles especially in highly congested locations or locations with high pedestrian volumes
- Effectiveness is limited along high volume commercial areas with high right-turn volumes

Arterial HOV Lanes

Description

Arterial High-Occupancy Vehicle (HOV) Lanes have similar restrictions as freeway HOV lanes. Only transit, motorcycles, and carpools (2+ or 3+ occupants) are allowed to use the lanes. These lanes are typically located in areas with heavy reoccurring congestion and infrequent right-turns. Allowing carpools can increase the person capacity of the lane and works well in coordination with the freeway HOV system.

Benefits

- Speed and reliability improvement for transit and HOV vehicles in congested corridors
- Works well along road segments where transit volumes might not be high enough to justify an exclusive transit lane and HOV demand is high
- Works well in coordination with freeway HOV system and onramps

Considerations

- Can increase general purpose congestion
- Effectiveness is limited along high volume commercial areas with high right-turn volumes
- Requires on-going enforcement which is complicated by carpools

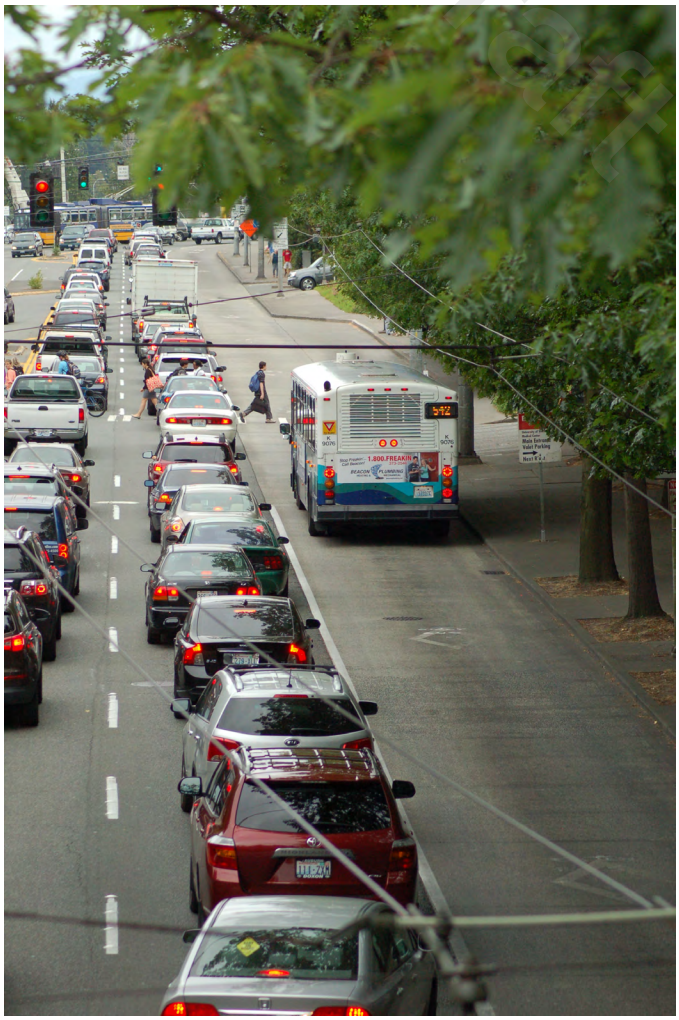


Figure 116 Bus in an HOV lane.

Figure 117 Bus in an HOV lane at a signalized intersection.

Transit-Only Lanes

Figure 118 Transit-only lane provides non-curb lane for buses.

Figure 119 Personal vehicles cannot use a transit-only lane.

Description

A transit-only lane reserves a lane for exclusive transit use along a corridor or through a choke point. This provides the highest level of transit priority on "local" streets and is often implemented along corridors with high bus volumes or with median bus rapid transit. Bus-only lanes can result in significant improvements to speed and reliability for transit, especially through choke points. Bus-only lanes can result in turn restrictions for general purpose traffic depending on the overall location and configuration of side streets.

Benefits

- Provides the highest level of transit priority of all arterial priority treatments
- Provides significant speed and reliability benefits in congested areas
- Ideal for locations with high bus volumes

Considerations

- Can increase general purpose congestion due to reduced capacity
- Can result in turn restrictions for general purpose traffic
- Generally the most difficult arterial running way treatment to implement
- Requires on-going enforcement

Transit-Only Street

Description

A transit-only street is a street that is reserved for transit vehicles for part or all of the day. This designation is often implemented to increase transit capacity of a roadway especially in urban centers and to ensure that buses are insulated from general purpose traffic congestion. Transit-only streets also allow for transit service to be consolidated onto a single street, simplifying and improving frequency of service for riders and reducing the impact of transit on general purpose traffic on parallel corridors.

Figure 120 Transit-only streets provide additional maneuvering space for buses.

Benefits

- Improves speed and reliability of multiple transit routes
- Can reduce transit impacts on parallel streets

Considerations

- Restricts general purpose travel on street and can create confusion for general purpose traffic at the interface with multi-purpose roadways
- Impacts access for general purpose traffic to parking garages and business, but can be managed via signage and allowance for access to mid-block locations
- Can increase congestion on parallel streets due to traffic diversion

Figure 121 Transit-only street during peak hours.

Busways

Description

Figure 122 Busways provide dedicated right-of-way for buses.

Busways are similar to transit only streets, but are typically built in their own right-of-way, such as abandoned railroad right-of-way. Busways can be fully grade-separated, allowing buses to bypass cross-traffic using bridges or tunnels. Busways can also be at-grade with transit signal priority at intersections. A combination of the two is also possible. Busways offer the highest level of speed and reliability benefits, sometimes similar to light rail. Busways can be expensive to build, especially fully grade-separate ones, and conversion of right-of-way to bus use can be complex due to competing objectives for the corridor and concern from adjacent property owners.

Benefits

- Separates buses from vehicles to a high degree, with either full grade-separation or transit signal priority for at-grade intersections.
- Provides a reliable corridor, where traffic can't impact bus travel
- Provides a high-capacity corridor for very frequent transit service
- Can allow for higher travel speeds than allowed on city streets
- Can result in transit service with similar speeds and frequency of light-rail

Figure 123 Busways may include grade-separated lanes for buses.

Considerations

- In most cases is only viable on unused utility or rail corridors
- Needs to incorporate grade separation into access locations or primary crossings
- Can have a significant cost if corridor needs to be acquired or grade-separated crossings are built
- Use of corridor often has competing objectives and potential opposition from adjacent property owners

Contra-flow Bus Lanes

Description

Contra-flow bus lanes allow buses to travel against traffic on a one-way street, turning a one-way street into a two-way street for transit. Contra-flow lanes can vary in length and are generally used to address transit routing/access issues.

Benefits

- Facilitates direct, congestion-free routing for otherwise complex routing to important connecting facilities
- Bus lane is less likely to be blocked by parked or loading vehicles
- Two-way routing reduces rider confusion

Considerations

- Can increase congestion due to conversion of travel lane to transit only
- Depending on the circulation needs of transit, could reduce efficiency of one-way street because of signal timing

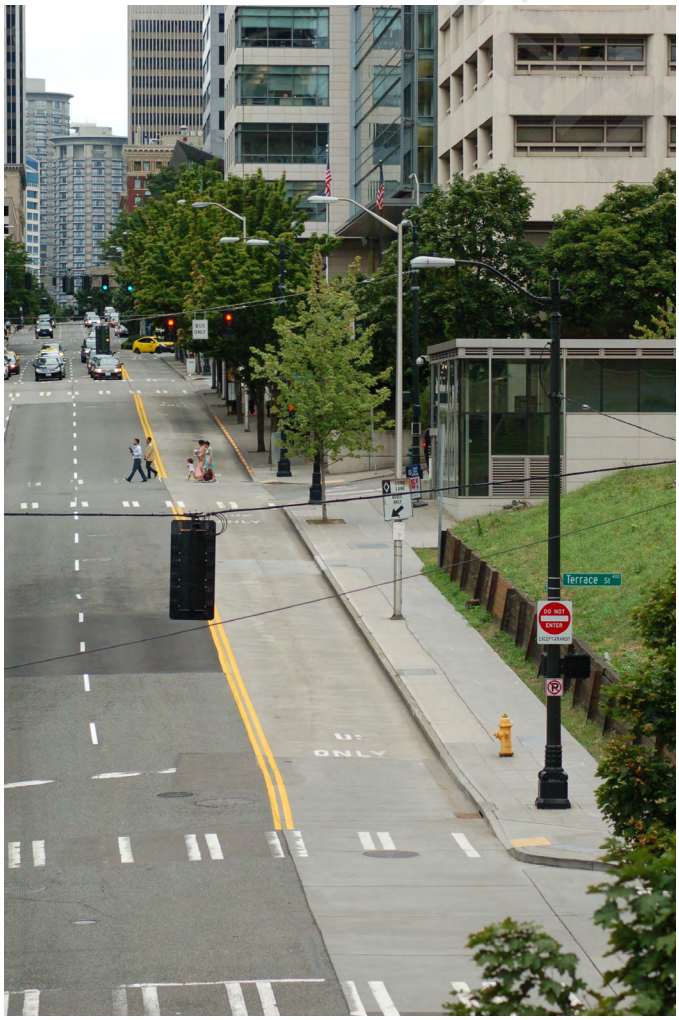


Figure 124 Contraflow lanes provide critical connections for transit networks.

Draft

ISSUE IDENTIFICATION

Figure 125 Staff and local stakeholders took part in a field review of several corridors being considered for transit priority investments, including Snoqualmie River Rd on the Bellevue College campus, pictured here.

When the efficiency of transit is reduced, so is its attractiveness to potential riders, and the many economic, social, and environmental benefits that transit provides are then also diminished. While the efficiency of transit service is affected by a variety of factors, the City of Bellevue has the ability to influence some of them, including the timing and coordination of traffic signals, the design of roadways, and the extent to which transit interacts with traffic congestion.

However, changing any of these factors from their current state requires difficult trade-offs to be made between competing interests. Whereas transit service trade-offs deal primarily with competing interests among different groups of transit users, capital investments in transit need to be balanced against the potential impacts on other modes of travel—namely private automobiles, but also bicycles and pedestrians. The extent to which the right-of-way is segmented in favor of any one mode necessarily reduces the availability of this space for other travel modes, so it is vital to carefully consider how alternative courses of action would affect all road users. Due to limitations imposed by financial resources, constrained rights-of-way, and the impacts that transit priority projects could have on other modes of travel, it is not possible to implement such projects everywhere that transit operates. Instead, attention should be directed to locations of particular concern, significance to the success of the overall network, and/or those capable of realizing notable improvement over existing operations.

The issue identification methodology presented in this section highlights candidate roadway segments along Frequent Transit Network corridors (based on congestion, bus volumes, transit usage, and multiple other factors) that would likely benefit from transit speed and reliability improvements.

DATA SOURCES

This section summarizes the data sources used to identify the location and magnitude of transit speed and reliability issues as part of the Capital Element of the TMP. The data sources include multiple measures of existing and future roadway congestion, bus delays as tracked through GPS data from Metro, transit ridership, mode share, bus volumes, and bus operator feedback. Data sources selected for this analysis were considered for the following reasons:

- Data was available in a format that could be used in the analysis.
- Data was relevant to the speed and reliability of transit service in Bellevue.
- Data sources provide information on short- and long-term measurements.

The following provides an overview of each data source used, including a description, review of the data's significance, how it was generated and/or from whom it was obtained, and any limitations that exist. Appendix D1 summarizes this information.

Draft

Figure 126 Bellevue Way NE and NE 12th St facing south. A queue jump lane for northbound buses is among the transit priority projects being considered based on issues identified by the process described here.

Draft

Standing Delays

Over the last few years, King County Metro buses have been equipped with a GPS-based tracking system. Data from the GPS system and other instruments like door sensors and the speedometer are integrated and recorded by an onboard computer during every bus trip operated. Using this data, it is possible to estimate the amount of time that buses are stopped by traffic signals and congestion. Time when a bus is stopped to pick up or drop off passengers is not included in this measure, as that is a function of the boarding and exiting process and not related to street congestion.

This is a rich and highly applicable dataset because it is a direct measure of the delay experienced by transit vehicles on a day-to-day basis. Intersections and roadway segments that experience frequent standing delays are easily identified through graphical representation of the data. Standing delay data was provided by King County Metro and compiled by screening GPS data for instances when a bus stopped with its doors closed while not at a bus stop. The data used in this analysis was collected on weekdays between January 7 and February 15, 2013.

Transit Ridership

Transit ridership is measured in terms of the forecasted weekday count of passengers that use transit in both directions along a street segment. Daily transit ridership is critical for highlighting corridors where transit priority investments will benefit the largest number of riders. For example, while transit priority at one location might save five seconds for 1,000 riders, the same improvement on a heavily utilized corridor could save five seconds for 10,000 riders—a tenfold increase. By identifying corridors with strong ridership, high-impact transit priority projects can be identified to ensure greater return on investment.

Draft

Weekday ridership data for this measure reflects 2010 observed counts and 2030 forecasts obtained from the Bellevue-Kirkland-Redmond (BKR) travel demand model (EMME version MP30r6.2). Figure 127 on page 126 and Figure 128 on page 127 depict these data sources. Because future transit ridership estimates are based on forecast assumptions, the results may ultimately vary due to real-world divergence from model assumptions.

Bus Volumes

Bus volumes are measured in terms of the number of buses operating each weekday in both directions along a street segment. Total weekday volumes are used—as opposed to volumes during a particular time of day—so that highlighted locations reflect those that exhibit high bus traffic over the course of an entire day, rather than a disproportionate surge exclusively during peak hours.

Bus volumes are an important measure when analyzing the efficiency of the bus network. As with transit ridership, focusing transit priority treatments where the most buses operate multiplies the benefits of transit priority, improving the return on investment. This is important for Metro and the City of Bellevue because each minute of travel, regardless of the number of passengers on-board, costs the same amount of money to operate and hence reflects the same share of total regional service hours allocated locally. The more efficiently transit service can operate within Bellevue, the more service Metro can provide with the same amount of resources. This is true in any circumstance, but it is particularly significant given Metro's continuing budget constraints.

The data used for analysis of bus volumes was compiled by City staff and reflects transit services in Bellevue as operated by the Spring 2012 Baseline Network and consistent with the span and headways

Figure 127 Daily transit usage patterns on Bellevue's arterials in 2010 by transit passenger per day arterial categories.

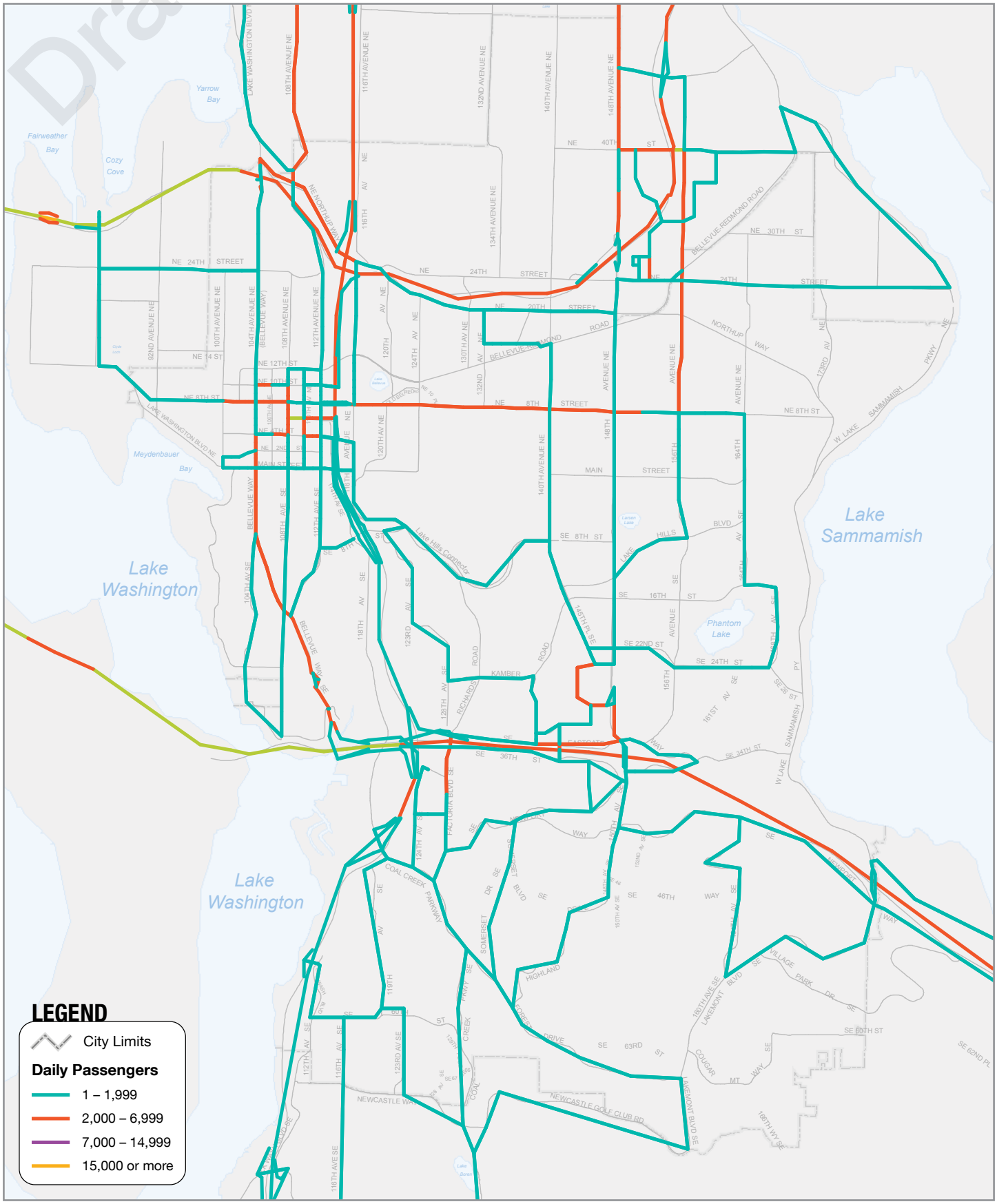


Figure 128 Daily transit usage patterns on Bellevue's arterials in 2030 by transit passenger per day arterial categories (derived from BKR model platform MP30r6.2 with transit routes defined in the 2010 *East Link Bus/Rail Integration Plan*).

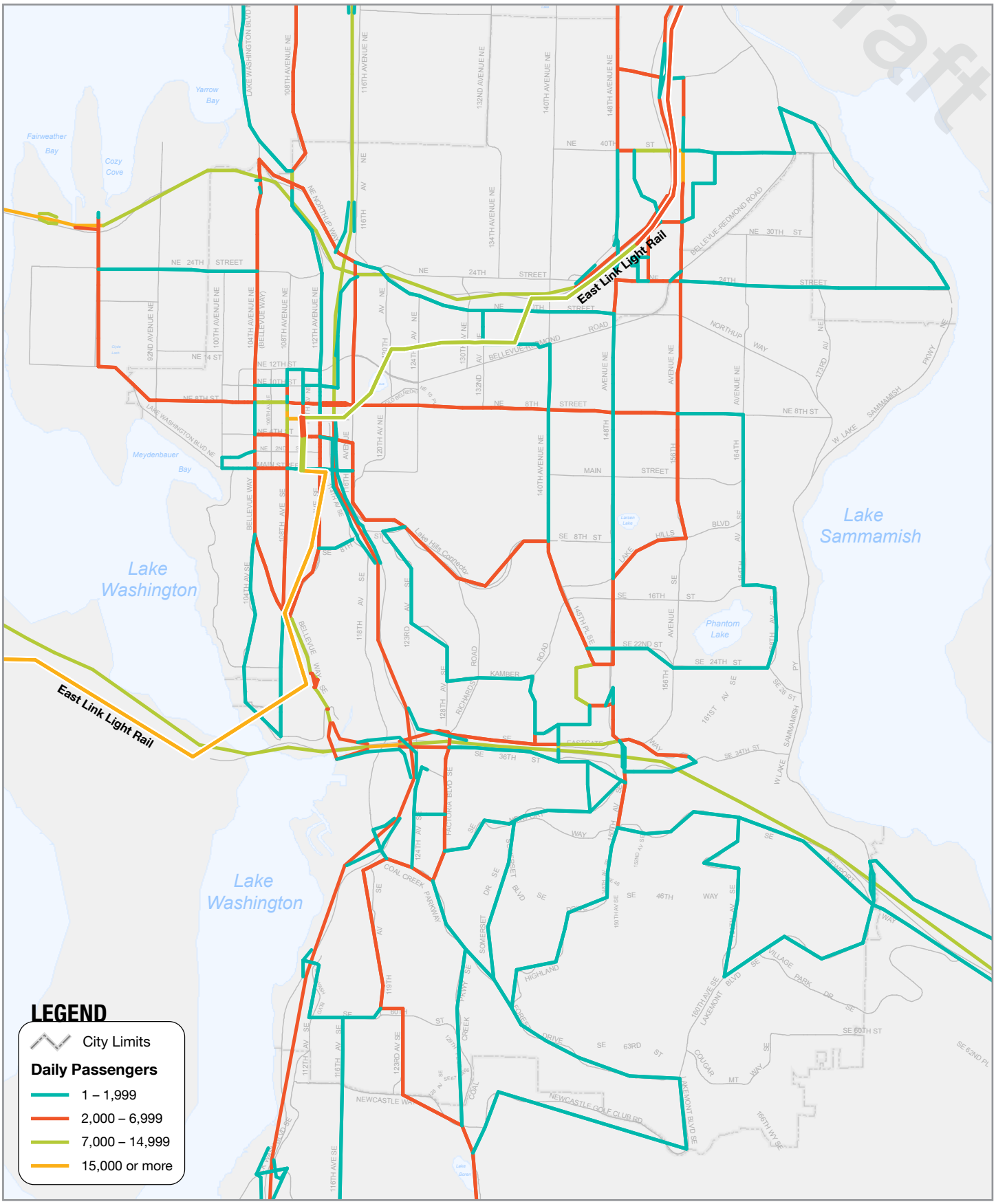


Figure 129 Bus trips operated daily, Spring 2012 Baseline Network.

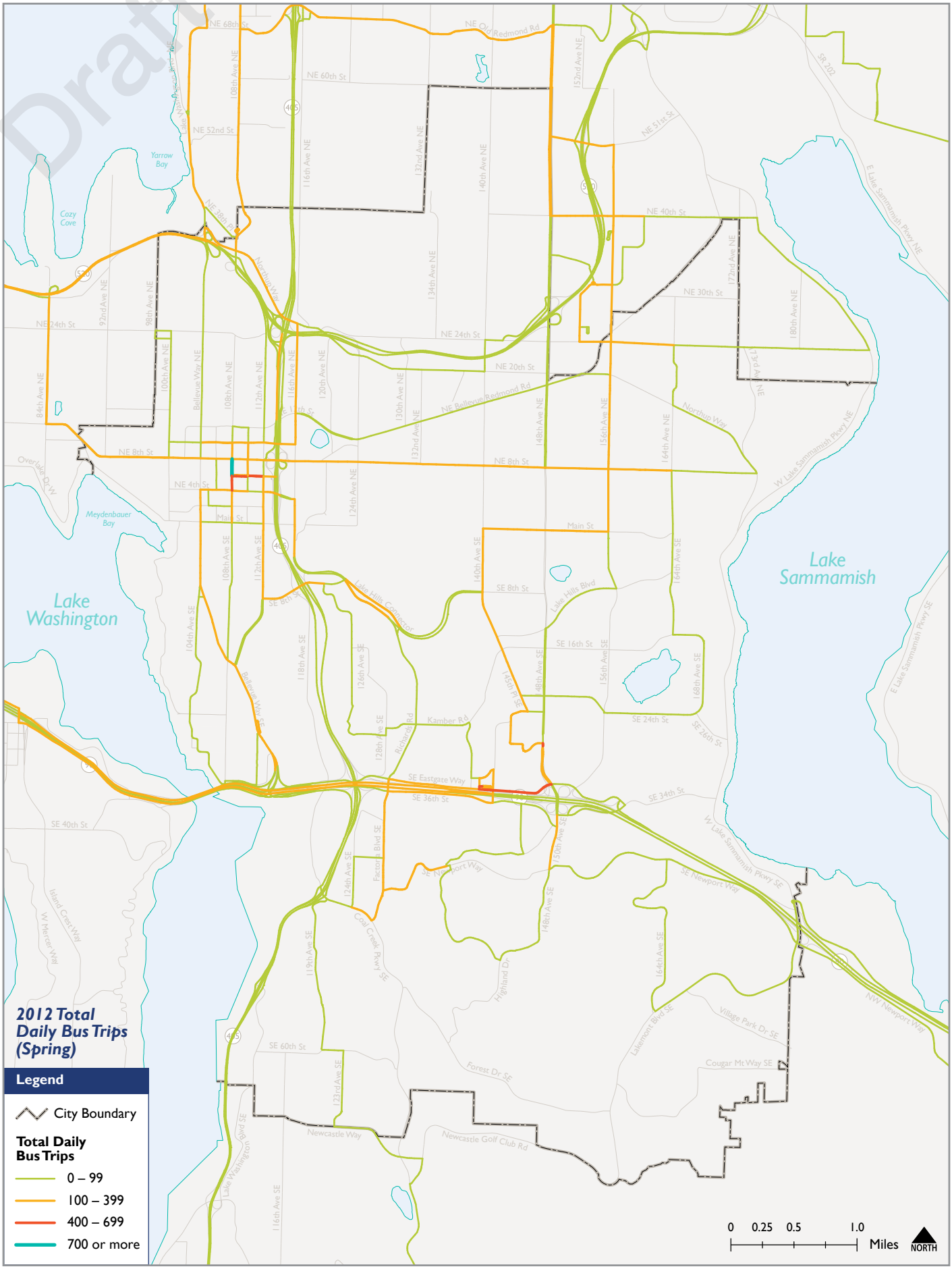
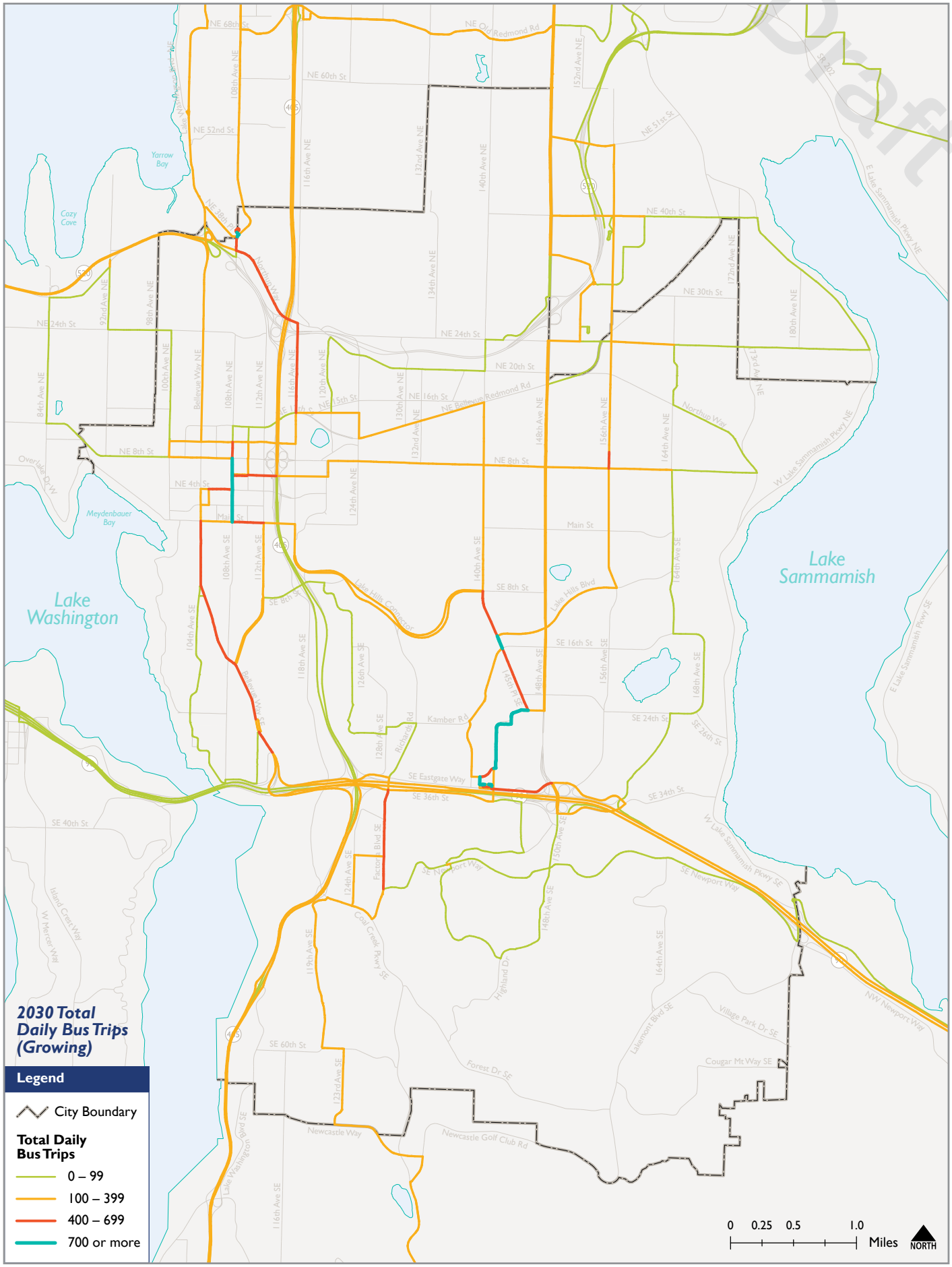


Figure 130 Bus trips operated daily, 2030 Growing Resources Network.



Draft

to be operated by the 2030 Growing Resources Network. (See the *Transit Service Vision Report* for details about each of these networks.) Figure 129 on page 128 and Figure 130 on page 129 compare the number of daily bus trips operated in 2012 and 2030, respectively. Among future networks, the bus volume analysis was completed only for the 2030 Growing Resources Network because that represents the maximum number of bus trips that will be operated per day within the TMP's implementation period. All routes were associated to the streets on which they operate, and the number of daily trips operated by each were aggregated for all overlapping segments.

Approach Delay

Delays experienced by vehicles on city streets are primarily the result of intersection related delays from traffic control devices like traffic signals. As vehicle volumes increase during peak periods and congestion builds, delays in the transportation network increase. This is particularly evident at signalized intersections. In congested and high-volume corridors, a single intersection can be a bottleneck for large parts of the network, creating significant delays to general purpose traffic and any buses traveling in general travel lanes.

The measure used in this analysis captures the sum of the average weekday, PM peak intersection approach delay, measured in seconds, along an analysis segment. City staff calculated approach delay for 2010 and 2030 using the Dynameq travel demand model. This model is more detailed than the City's travel demand model because it provides specific operational metrics at an intersection level. However, not all aspects of traffic are modeled, such as the impact of high pedestrian volumes on turning vehicle delays. Only intersection approaches served by bus routes that operate frequent headways were included in the analysis.

Approach Queue

The queue length is measured as the length of vehicles waiting to travel through an intersection. Intersection approach queues are summarized along an analysis segment. The approach queue experienced for an intersection approach is influenced by its signal timing (green time allocated to that approach), signal coordination, and traffic volumes.

Data for the approach queues was included in the TMP Capital Element analysis because it can identify approaches that are currently or expected to experience long vehicle queues, impacting the speed and reliability along key transit corridors. This information can help guide transit priority treatment, such as installation of queue jumps or bus-only lanes so that buses can bypass queued vehicles.

Forecasted average PM peak hour approach queue is reported for 2010 and 2030 in terms of the average length in feet (see Figure 131 on page 132 and Figure 132 on page 133, respectively). This data is based on the City of Bellevue's Dynameq travel demand model.

Intersection Level of Service

The performance of an intersection can be reported in many ways, but intersection level-of-service (LOS) is the measure most commonly used by traffic engineers. LOS uses the average delay experienced by a vehicle at an intersection and assigns a letter grade of A through F, with an intersection of LOS A experiencing little delay and an intersection of LOS F experiencing significant delay.

With respect to transit speed and reliability, intersection level-of-service has several implications. An intersection with a poor LOS indicates a location where transit likely experiences delays; however, it also indicates an intersection where transit priority treatments are likely more difficult to implement successfully due to impacts on other modes or physical limitations. In contrast, intersections with

Draft

Figure 131 Intersection level-of-service (LOS) and average queue length (in feet) in 2010 at FTN intersections.

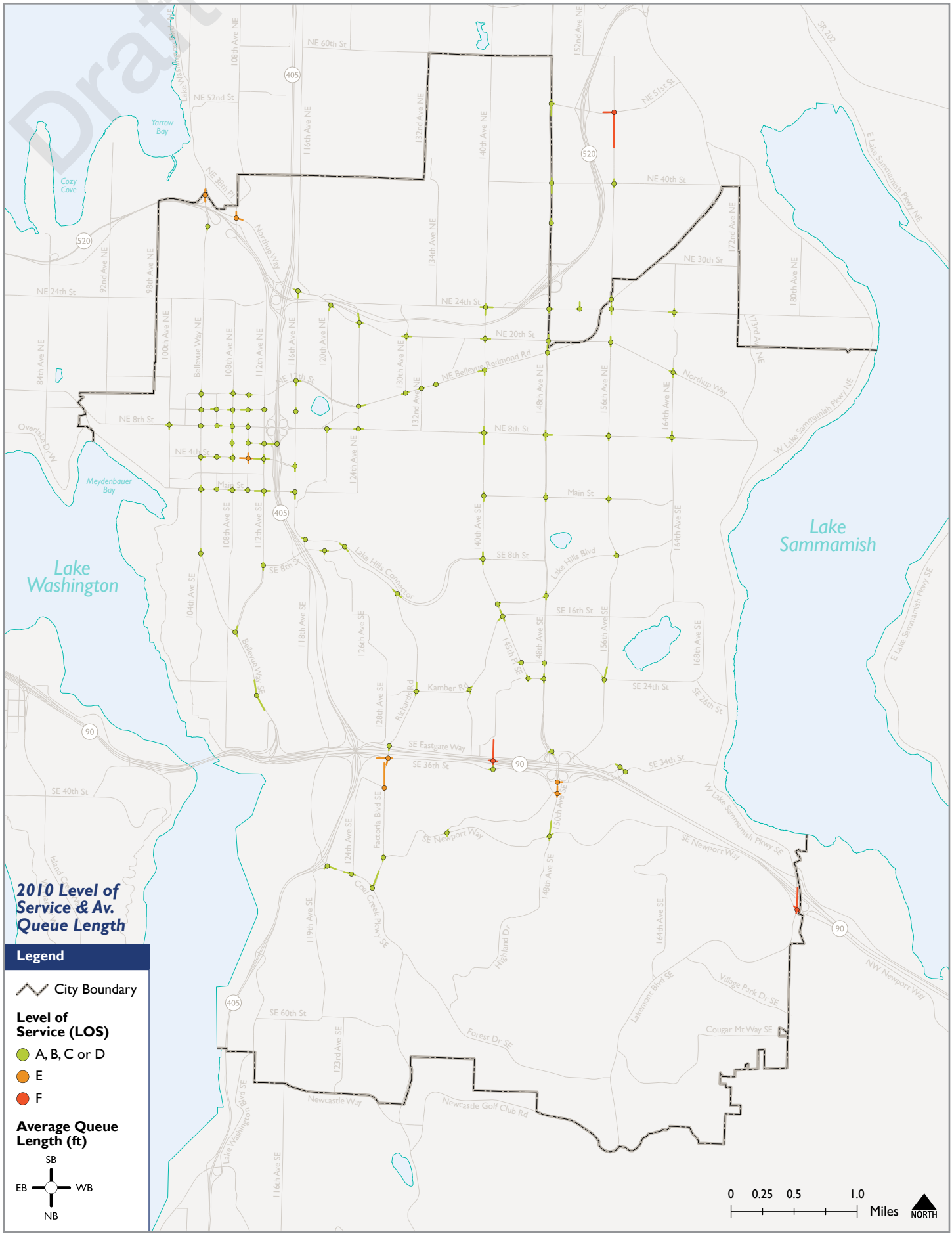
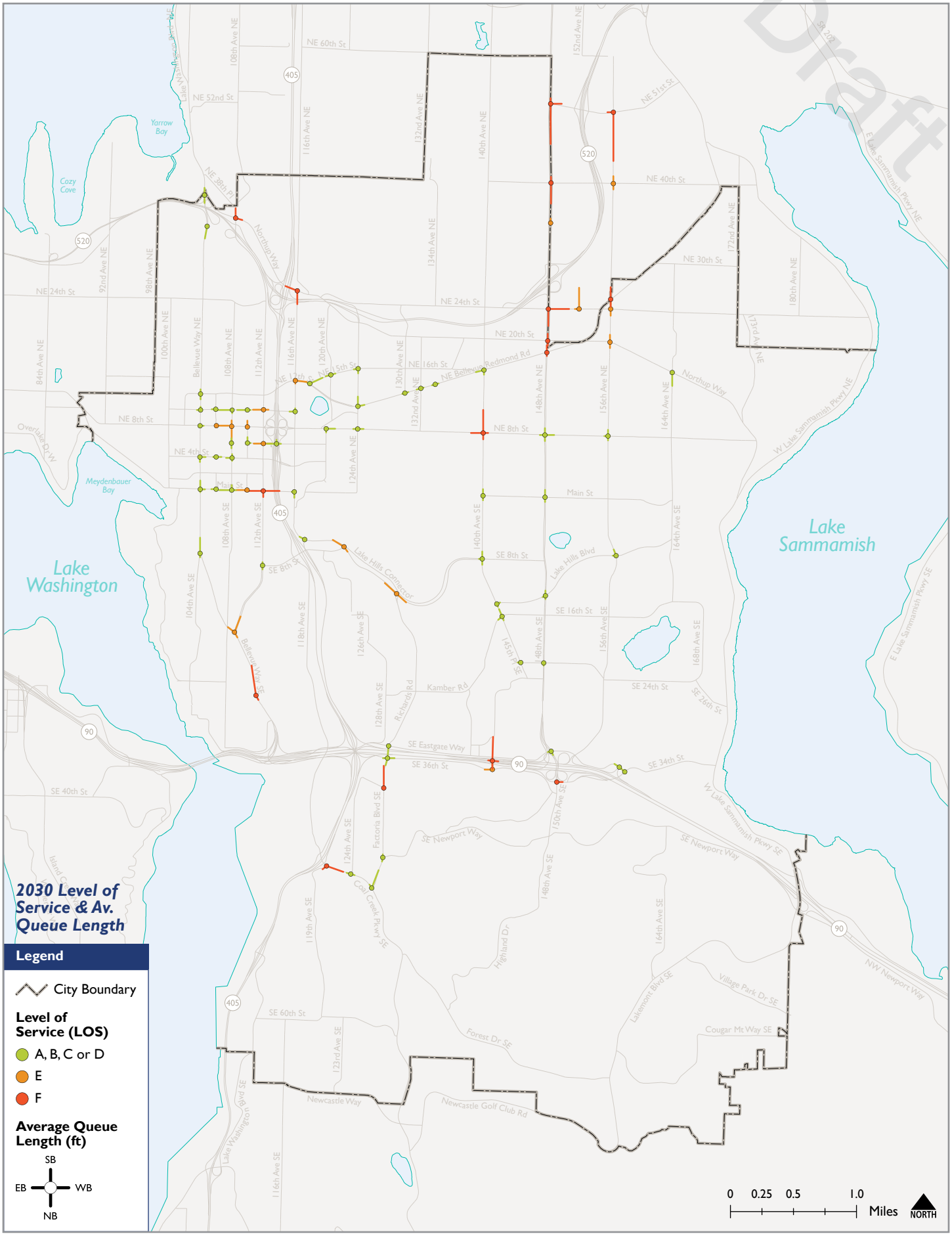


Figure 132 Intersection level-of-service (LOS) and average queue length (in feet) in 2030 at FTN intersections.



Draft

Safety – Safety is always a paramount concern for the City of Bellevue and Metro. Safety issue can result in slower and less reliability travel times as operators slow to ensure they are operating coaches safely.

Signal Failure – At some intersections it can take buses multiple green lights to get through an intersection, adding delay and travel time reliability issues. The cause of these delays vary depending on the location.

Signal Timing – Traffic lights are controlled in several ways and are generally timed in a way to minimize vehicle delay. Identifying locations or corridors where coach operators observed potentially unnecessary delay due to timing of the lights will help identify locations where various operational changes like revised traffic light timing could be made friendlier to transit.

Maneuver Delays – Metro coaches are some of the largest vehicles on many of the roads they serve. Locations which are hard for operators to negotiate can cause speed and reliability issues which can repeat hundreds of times a day. Intersections were coaches make a right turn can be particularly troublesome.

General Delays – While traffic models have been used to identify congestion related delays, there may be locations where, due to some local circumstance or roadway design, additional detail from coach operators could help more clearly understand the cause of delays and possible solutions. Locations with left turns are of particular concern as the models used are not sensitive to these delays.

medium or good LOS have less delay and are likely easier to implement transit priority because impacts on other modes are less significant. However, this also means that the benefits realized by any transit priority treatments implemented are more limited because the delays originally experienced are less substantial.

As with approach delay data, City staff generated intersection LOS data based on the 2010 and 2030 PM peak hour Dynameq travel demand model. Intersection LOS was summarized by analysis segment, using the worst intersection LOS along the segment (see Figure 131 on page 132 and Figure 132 on page 133 for 2010 and 2030 data, respectively).

Operator Feedback

Through their work and often years of experience, Metro coach operators learn traffic patterns in a way that most road users likely never will. They see how traffic changes during the day and over the course of a year, as well as how service changes affect interactions between transit and traffic. Coach operators can therefore provide significant insight into existing traffic congestion on Bellevue streets and help identify critical points in the network that could benefit from closer consideration by planners.

An optional survey was used to solicit feedback from coach operators about several general categories of issues related to transit speed and reliability, as shown at the right. This feedback was valuable because it helped to reaffirm some of the data provided by other sources and filled in the gaps left by those sources in some cases. Responses were collected by paper survey with questions, a map, and an area for written response (see the *Coach Operator Outreach Report*). The primary challenge with leveraging operator feedback is combining this more subjective feedback with the more objective measures used in other analyses.

DATA PROCESSING

Draft

Several data processing steps were necessary to convert the above data into information that could be used in the issues identification analysis. Data processing was completed using geographic information systems (GIS) due to the spatial nature of the data and analysis.

The City of Bellevue and King County Metro provided data in several formats, primarily GIS shapefiles. Most data sources were derived from a different source, so extensive discussion between the City and Metro occurred to ensure that data was accurately mapped and used. Some format conversion, data integration, and map modifications of the data were required. Several files required modifications to geometry to ensure that lines overlapped, but no numeric data was modified in the process.

Data analysis segments, or the unit at which the analysis was completed on, was also developed. Analysis segments were based off the street network, with segments primarily extending from one signalized intersection to another. Data from each source was summarized using these analysis segments. Appendix D1 on page A217 contains maps of each data source displayed using the analysis segments. The sections below describe in detail the steps completed to prepare data for analysis.

Data Collection

Approach delay, approach queueing and LOS data were provided by the City of Bellevue in separate GIS shapefile and excel files which were joined and verified to ensure the two data sources were correctly joined. This process was completed in coordination with the City of Bellevue as City staff is intimately familiar with the data. Five batches of operator surveys were provided by Metro to the City. The location of applicable, specific and clear operator survey comments were recorded in GIS.

Draft

Data Mapping

Once data was mapped in GIS, several of the data sources did not overlap. Overlap was necessary to combine data in later steps. To ensure that all files overlapped, the lines and points of the transit ridership and bus volume data layers were shifted to overlap with the other layers. These changes were generally minor and only involved moving the location of the lines and points; no changes were made to the numeric values of the data.

Analysis Segment Development

A single common analysis unit is required to compare the multiple data sources used in the issue identification. The following process, illustrated in Figure 133, was used to develop the analysis segments:

1. Street segments on which the 2030 Frequent Transit Network (FTN) operates were identified and selected from the City's GIS street centerline shapefile.
2. These street segments, of which there is one for each city block, were grouped into analysis segments comprised of one or more street segments. Signalized intersections were used as the primary break point between analysis segments, however some unsignalized intersections were used in locations where signalized intersections are infrequent.
3. Each analysis segment was then buffered by 40 feet in all directions, creating an 80-foot wide polygon slightly longer than the analysis segment. This polygon, referred to as the buffered analysis segment, was used in the remainder of the analysis to combine, analyze, and display the issue identification data and composite scores.

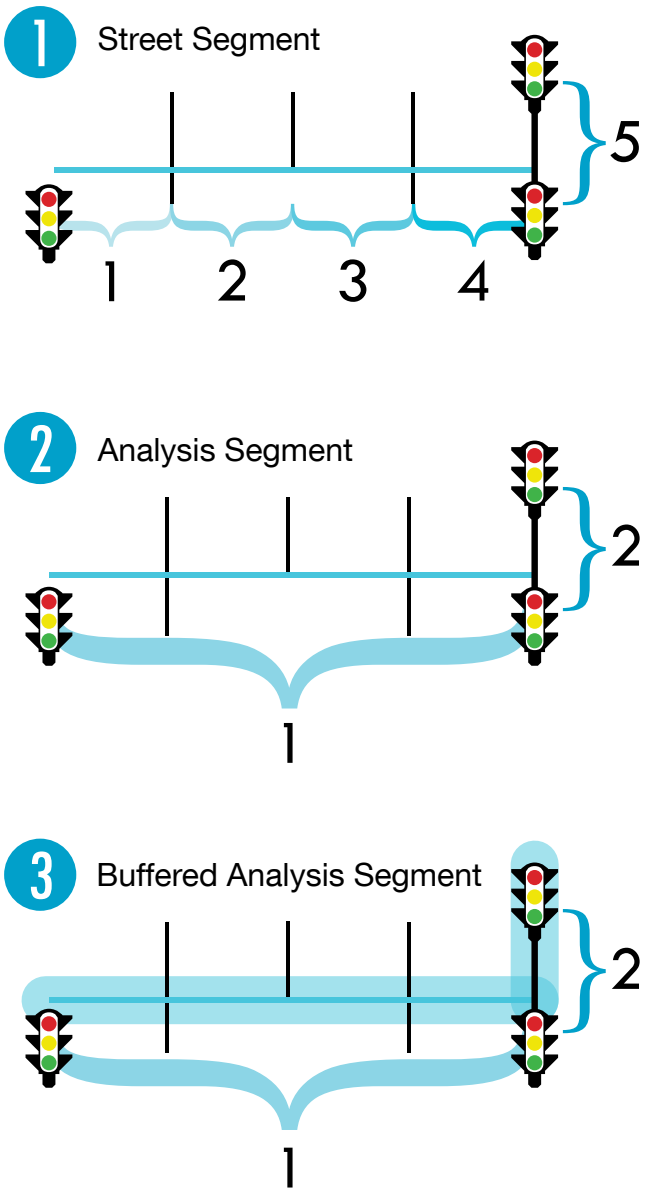


Figure 133 Analysis segment development.

Analysis Segment Data Transfer

After the buffered analysis segments were developed, data from the various GIS data inputs was spatially joined to these segments. Bus volumes and ridership data was spatial joined to the buffered analysis segment using the line's mid-point to reduce overlap issues. GPS-derived standing delays within the buffered analysis segment polygons were summed to compute the total delay occurring inside the polygons. Approach queue and approach delay for all intersections within each buffered analysis segment polygon were likewise summed. Intersection level-of-service (LOS) was assigned to buffer analysis segments based on the worst LOS of all intersections within the buffered analysis segment. Operator feedback was manually associated to relevant buffered analysis segments.

Draft

Draft

DATA ANALYSIS

The analysis steps outlined below brings multiple critical measures together into two composite scores focused at different time horizons, one for the short-term and another for the long-term. These composite scores help identify locations along the frequent transit network where multiple issues compound creating larger issues for transit speed and reliability.

The combination of multiple measures into the composite score facilitates comparison of the system. Using the analysis segments previously developed, issue identification was completed. This involved scoring, grouping and weighting of the various important measures. This approach was developed and modified with feedback from City and Metro staff.

Data Scoring

Each data source was grouped into four quartiles to evenly distribute data for each measure into four groups. Each data source was then assigned a score of 1 to 4 depending on the quartile in which the data was contained. Data with 2010 and 2030 data such as transit ridership and bus volumes were grouped by quartile using the 2030 results. Table 15 illustrates the scoring system.

Intersection LOS and operator comments, which have different scoring systems, were scored in accordance with Table 16. LOS is scored on a letter basis with A indicating little congestion and F indicating significant congestion. The low number of operator comments and general concentration of the comments received necessitated a unique scoring system.

Table 15 Quartile Scoring.

Quartile	Score
Fourth (Top 25%)	4
Third (Middle-Top 25%)	3
Second (Middle-Bottom 25%)	2
First (Bottom 25%)	1
None / No Data	0

Table 16 LOS and Operator Survey Scoring.

Level-of-Service (LOS)	Score
F	3
E	2
D	1
A, B, C	0

Operator Comments	Score
4-8	4
3	3
2	2
1	1

Composite Scores

The data analysis structure was designed to capture two key issues. The first issue, related to the time horizon, is addressed by developing two composite scores, one for the short-term and another for the long-term. Current and future needs may be different due to changes in the transit and transportation network or change in congestion. The solutions to short- or long-term problems can also vary, from small spot fixes for short-term issues to significant capital investments in locations with both short- and long-term issues.

Additionally, in the short-term, directly measured rather than modeled data is available. This is especially the case with bus GPS standing delays which are a direct measure of existing transit speed and reliability. The use of two composite measures more directly links each composite to a set of speed and reliability tools.

Draft

Short-Term Composite – This composite uses existing GPS bus delays, operator feedback, existing bus volumes and existing ridership volumes. This composite highlight locations where investments in speed and reliability will realize short-term benefits.

Long-Term Composite – This composite uses future bus volumes, future ridership volumes, and future modeled congestion. This is key for guiding capital investments to meet future transit needs and congestion.

Data Weighting

The second issue relates to the relative importance and combination of multiple data sources. When combining multiple measures into a composite score, the relative importance of each component needs to be assessed. More important measures should be elevated, while less important measures should be lowered. These adjustments are done using weighting factors.

Approach delay, approach queue, intersection LOS and bus standing delay are all highly related measure. If one of these four measures is scores poorly, the remaining three are also likely to score poorly. To address the overlap of these data sources and respond to City and Metro comments, approach delay, approach queue and intersection LOS were removed from the short-term composite score.

Table 17 Composite Score Weighting.

Measure	Short-Term Composite		Long-Term Composite	
	Weight	Possible Points	Weight	Possible Points
Standing Delays	4x	16	-	-
Transit Ridership	2x	8	2x	8
Bus Volumes	1x	4	1x	4
Approach Delay	-	-	1x	4
Approach Queue	-	-	1x	4
Intersection LOS	-	-	1x	4
Operator Survey	1x	4	-	-
Total	8x	32	6x	24

Draft

Weighting of both short- and long-term composite scores were set such that delay or congestion related factors represent half of the overall composite scores.

Additionally, the Transit Master Planning effort has clearly identified transit ridership as the major driver behind investment in transit service. To account for the significant importance of this measure relative to other measures a weighting factor of 2x was assigned to transit ridership in both the short- and long-term composite.

Table 17 on page 139 contains the weighting factors used both in the short-term and long-term analysis as well as the total score possible for each composite. Four measures are used for the short-term composite, while five measures are used for the long-term composite. Although the two measures are related, they cannot be directly related because point allocations and totals are different.

RESULTS

Using the scoring, grouping, and weighting described above and summarized in Table 18, short- and long-term composite measure maps were developed (see Figure 134 and Figure 135). A map for each measure is also contained in Appendix 1. As previously noted, these maps do not necessarily identify priorities; rather, they indicate locations where a confluence of issues is concentrated and more detailed analysis will be necessary. Buffered analysis segments with low composite scores have fewer issues while areas with higher scores have more compounding issues.

Twenty corridors of particular interest were identified for further consideration, including BKR modeling to compare vehicle throughput to person throughput, consistent with guidance from the Measures of Effectiveness Report. Refer to Appendix 3 on page A230 for additional details.

Table 18 Issue Identification: Sources, Measures, and Weighting.

Short-Term Composite Measure	Data Source	Description	Limitations	Metric	Weight
Standing Delays	AVL GPS Data	GPS-based AVL data for standing buses with their doors closed. Data is summarized by intersection.	Raw data had not yet been processed	Sum of weekday bus standing delays between 1/7 and 2/15 in minutes	4x
Transit Ridership	BKR Model	Estimated average daily transit ridership by model segment.		2010 average weekday transit ridership	2x
Bus Volumes	Spring 2013, 2030 BKR Model	Daily transit trips by road segment based on Spring 2012 service.		2013 average weekday bus volumes	1x
Safety Issues	Operator Survey	Safety issues identified by coach operators that impact speed or reliability.	Subjective	Comment	1x
Signal Failure	Operator Survey	Intersections identified by coach operators that consistently take multiple green lights to get through either due to insufficient green time or congestion.		Comment	1x
Signal Timing	Operator Survey	Signals or corridors identified by coach operators with little vehicle congestion and unnecessary delays due to poorly time signals or long signal cycles.	Subjective	Comment	1x
Maneuver Delay	Operator Survey	Locations identified by coach operators which impact speed and reliability due to difficult turning radii, required lane changes, or other roadway geometry issues.		Comment	1x
General Delay	Operator Survey	Consistent congestion-related delays identified by coach operators.	Subjective	Comment	1x
				Total Possible:	32

Long-Term Composite Measure	Data Source	Description	Limitations	Metric	Weight
Transit Ridership	BKR Model	Estimated average daily transit ridership by model segment.		2030 average weekday transit ridership	2x
Bus Volumes	Spring 2013, 2030 BKR Model	Daily transit trips by road segment based on the 2030 Growing Resources Frequent Transit Network (FTN).		2030 average weekday bus volumes	1x
Approach Delay	Dynameq Model	Estimated average PM peak hour delay in second by approach for signalized intersections in the 2030 Growing Resources Frequent Transit Network (FTN).		2030 sum of average weekday PM Peak hour approach delay (seconds of delay)	1x
Approach Queue	Dynameq Model	Estimated average PM peak hour queue length in feet by approach for signalized intersections in the 2030 Growing Resources Frequent Transit Network (FTN).	Determining meaningful threshold, related to approach delay	2030 sum of average weekday PM Peak hour approach queue length (in feet)	1x
Intersection LOS	Dynameq Model	Estimated PM peak hour LOS for signalized intersections in the 2030 Growing Resources Frequent Transit Network (FTN).		2030 intersection LOS	1x
				Total Possible:	24

Measures Considered But Not Used	Data Source	Description	Limitations
Street Congestion	BKR Model	Estimated PM peak hour vehicle volumes divided by estimated roadway capacity. Ratios near or above 1 indicate roadways with congestion.	Less accurate than Dynameq in areas with closely spaced signals and complex vehicle queues.
Mode Share	BKR Model	Estimated PM peak hour HOV person throughout divided by total roadway person throughput. Ratios closer to 1 indicate higher relative person HOV throughput.	Not available for all corridors
Scheduled Speed	TPI Travel Speed	Scheduled travel time by time of day divided by the distance between origin and destination time point.	Not available
Travel Time Variability	TPI Variability	Variation in travel time per TPI. High variation indicates TPIs with travel time reliability issues.	Not available

Draft

Figure 134 Short-term composite score.

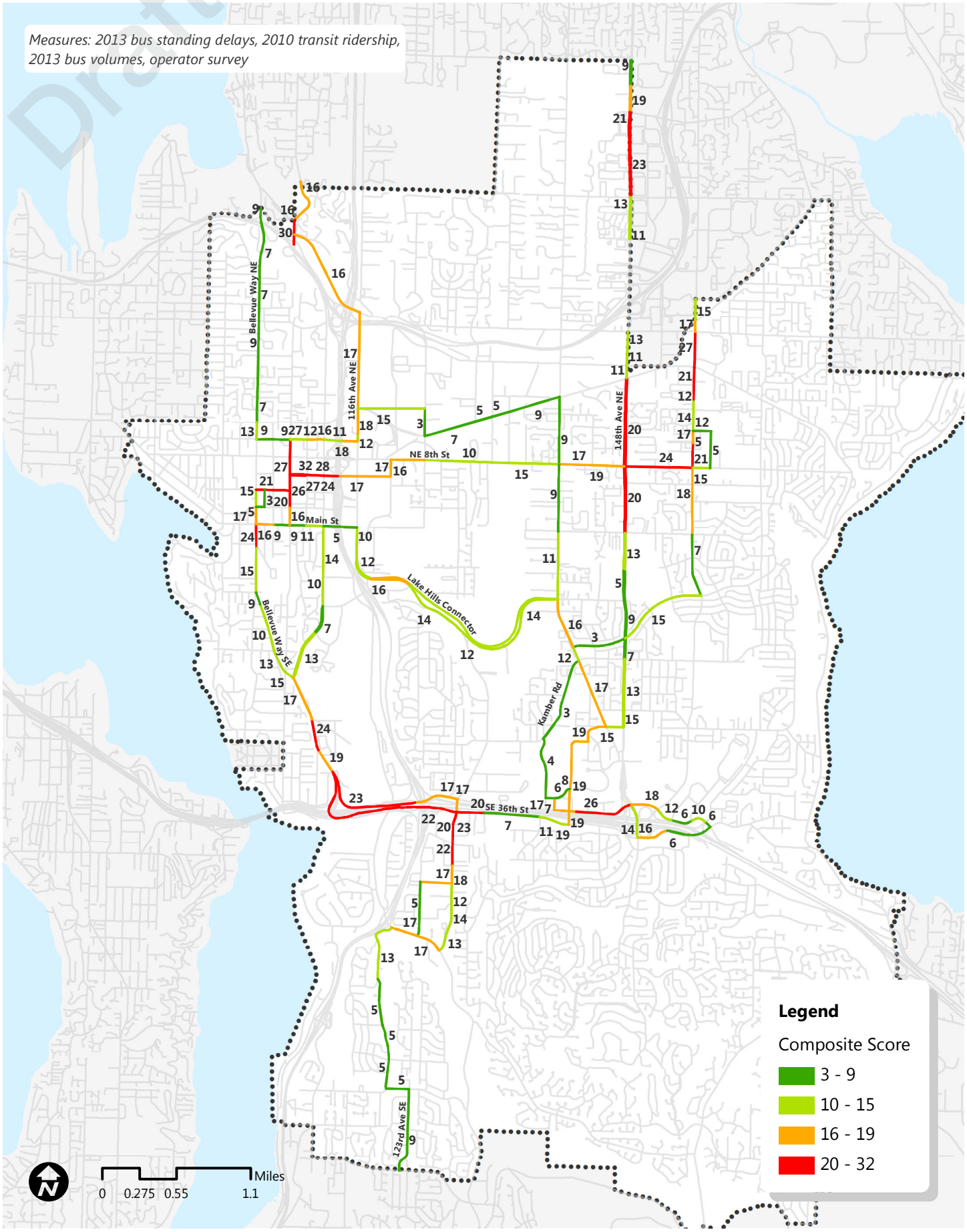
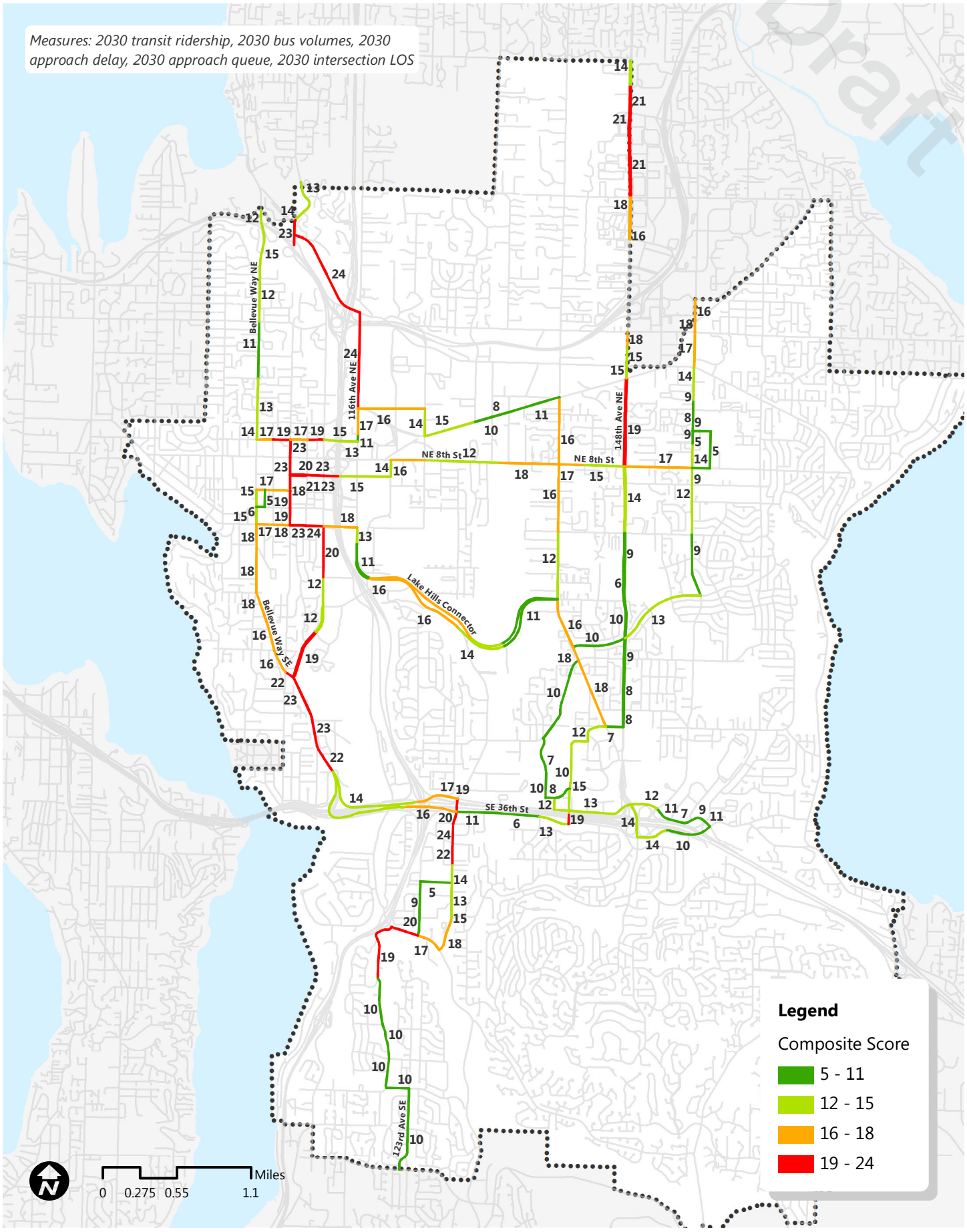


Figure 135 Long-term composite score.



Draft

This page intentionally left blank.

POTENTIAL IMPROVEMENTS

Draft

This section responds to the Transportation Commission's Capital-Oriented Strategy: "Invest in transit priority measures along Frequent Transit Network corridors." The Transit Capital Vision identifies a total of 107 capital projects that would benefit transit speed and reliability. As shown in Table 19, these include fifty-eight physical improvements to roadways or intersections—including nineteen running way and thirty-nine spot improvement projects—five tracking and additional study projects, and forty-four near-term transit signal priority (TSP) projects. All of these projects are based on the concepts and treatment types identified in the Transit Priority Toolbox. Figure 137 on page 147 depicts the location and/or general extent of each of the running way and spot improvement projects, as well as two location-specific tracking projects and projects that have been eliminated from further consideration.

This list of projects and the estimated cost of each was developed by TMP consultant Transpo Group with consideration given to existing data, field investigation, and input from staff and transit agency representatives. Project prioritization was completed by staff. The list presented here includes all of the potentially beneficial projects that have not been eliminated from consideration based on exceptional technical or contextual limitations. Visualizations have been generated for some of the projects presented to help communicate how a particular type of treatment could be applied to specific situations (for example, see Figure 136 on page 146). It must be emphasized that these visualizations are only conceptual and do not represent final designs or engineering-level detail.

Table 19 Summary of speed and reliability projects by type.

Project Type	No. of Projects
Running Way Improvements	19
HOV Lanes	8
BAT Lanes	6
Roadway Construction	5
Spot Improvements	39
Queue Jump Lanes	16
Intersection and Roadway Improvements	13
Signalization Improvements	10
TSP Projects (Near-term)	44
Tracking & Additional Study	5
Total	107

Draft

As noted in other sections, the projects identified here include only intersections and roads along FTN corridors, a subset of the 2030 Growing Resources scenario. The issue identification results presented on the preceding pages informed the development of this project list and directed attention to those locations with the most significant issues. Projects identified in past planning efforts are also included in this list. Refinements to the list of potential improvements were informed by the service characteristics of bus routes, transit ridership, and bus volumes by time of day; arterial traffic volume by direction; placement of bus stops, intersection geometry, turn movement counts and capacity, and safety considerations; pedestrian and bicycle impacts; and the overall scale of improvements in terms of roadway width and right-of-way.

Figure 136 Running Way Improvement Project L1: A southbound median HOV lane will be constructed on Bellevue Way SE between the South Bellevue Park-and-Ride and I-90 by Sound Transit as part of the East Link light rail extension project. This will be achieved by constructing a new lane, thereby maintaining all existing general purpose lanes. Aerial images depict roadway striping before and after construction.

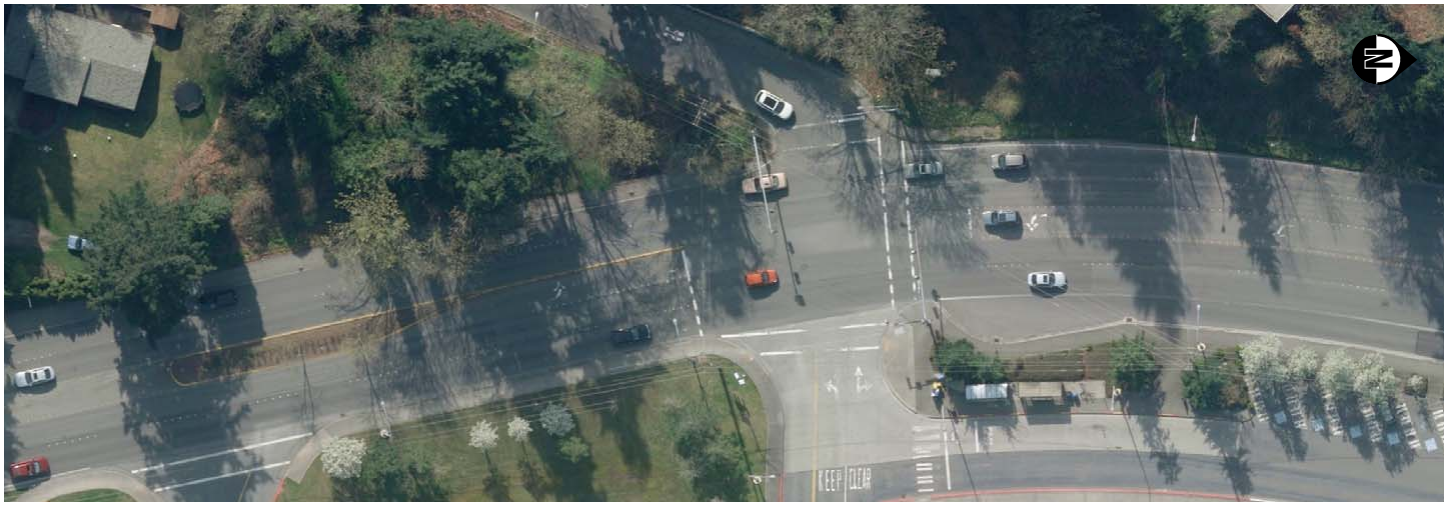
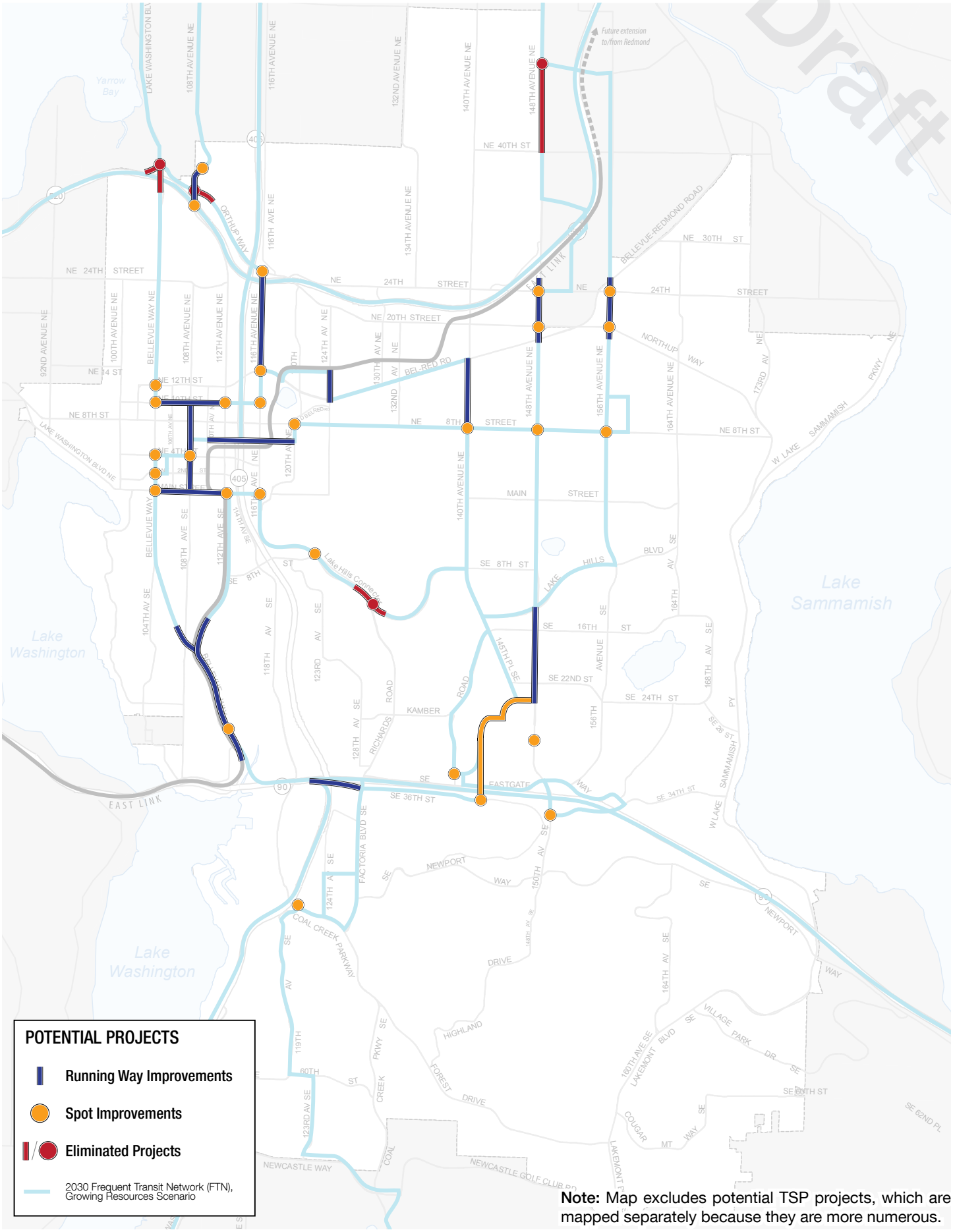


Figure 137 Potential spot and running-way improvement projects.



Draft

ESTIMATED PROJECT COSTS

General cost estimates were identified by TMP consultants for each project, as summarized in Table 20. Figure 138 maps the location and estimated costs of all running way and spot improvement projects, as well as two location-specific tracking projects. Citywide tracking projects and TSP projects are not represented in the map, in the case of the latter because they are too numerous to represent clearly together with other projects.

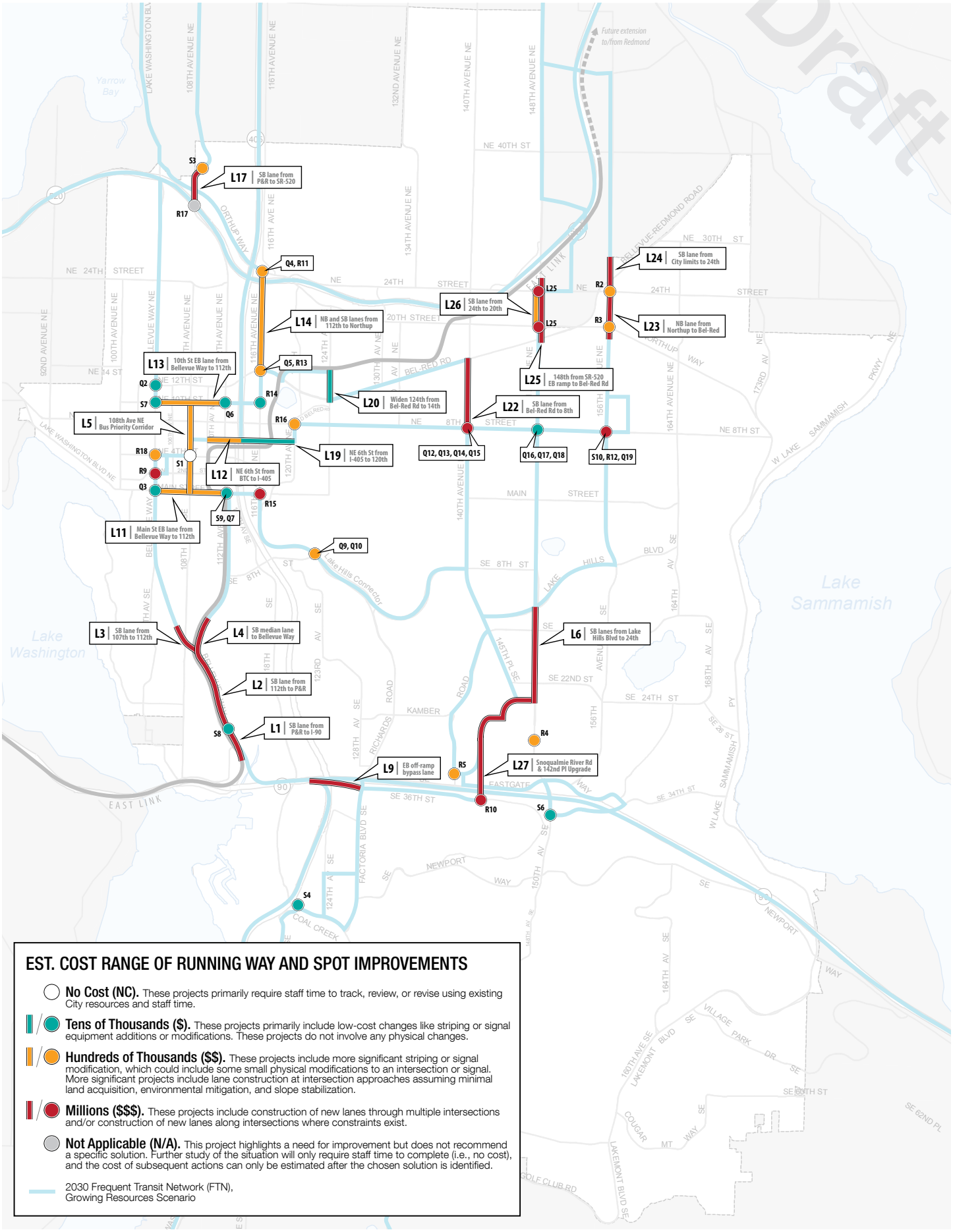
The cost ranges shown in Table 20 are based on a high-level review of the type and extent of projects and their associated physical investments. Projects were assigned to each cost range based on a review of the proposed project, site context, and other factors that might impact cost. Some examples of these considerations include roadway re-channelization or widening, traffic signal modification, sidewalk and road construction, potential environmental mitigation, slope stabilization, utility modifications, and property acquisition. The cost ranges identified are consistent with the scale of the projects, but they do not reflect detailed design or engineering.

Although these estimates are only general, they provide a basis on which to begin considering the overall cost of implementing the Transit Capital Vision and the potential implementation horizon of the various constituent projects. In general, it can reasonably be assumed that more expensive projects will require more time to implement than less expensive projects. However, a variety of factors will be considered when determining when a given project will be adopted and advanced by the Capital Investment Program (CIP), including the coordination of projects with one another, other infrastructure projects (e.g. East Link), and future route network implementation, the availability of grants that might expedite the funding of a particular project, and the priority assigned to a project based on the criteria described on the following pages.

Table 20 Summary of speed and reliability projects by cost.

Estimated Project Cost	No. of Projects
No Cost (NC) These projects primarily require staff time to track, review, or revise using existing City resources and staff time.	6
Tens of Thousands ($) These projects primarily include low-cost changes like striping or signal equipment additions or modifications. These projects do not involve any physical changes.	66
Hundreds of Thousands ($$) These projects include more significant striping or signal modification, which could include some small physical modifications to an intersection or signal. More significant projects include lane construction at intersection approaches assuming minimal land acquisition, environmental mitigation, and slope stabilization.	16
Millions ($$$) These projects include construction of new lanes through multiple intersections and/or construction of new lanes along intersections where constraints exist.	18
Not Applicable (N/A) This project highlights a need for improvement but does not recommend a specific solution. Further study of the situation will only require staff time to complete (i.e., no cost), and the cost of subsequent actions can only be estimated after the chosen solution is identified.	1
Total	107

Figure 138 Transit running way and spot improvement projects by estimated cost range.



Draft

PROJECT PRIORITIZATION

The Transportation Commission assigned priorities to each of the running way, spot improvement, and location-specific tracking projects presented in this report. The results of this long-term priorization are summarized in Table 21 and mapped in Figure 139. The prioritization criteria are summarized at left and described in greater detail below.

The purpose of prioritizing the proposed capital projects is to maximize the value to the Frequent Transit Network (FTN). Thus, the FTN's long-term composite scores serve as the primary means of identifying a project's priority. The ranges for High, Medium, and Low Priority (shown at left) are consistent with the categories shown in Figure 135 on page 143. For projects that span multiple corridor analysis segments and are characterized by more than one long-term composite score, a simple average of the maximum and minimum scores was used to determine a project's base priority.

These initial priority assignments were then refined according to three separate considerations. First, if a proposed project has already been adopted by the Transportation Facilities Plan (TFP) or Capital Investment Program (CIP), that project's priority was increased by one category. Likewise, the same action was taken if a project is specifically required to implement the future FTN route structure. The latter consideration applied to two projects, the NE 6th St Extension (Project L19) and the Bellevue College Connection (Project L27), both of which also have associated TFP projects. Therefore, while these projects both ranked as Low Priority based on their composite scores, they have been elevated to High Priority. It is worth noting that both projects' composite scores are low because impacts from general purpose traffic will be minimal on these facilities. However, both will provide considerable travel time savings by simplifying route structures

Long-Term Project Prioritization Criteria

Base Priority Identification:

1.) Long-Term Corridor Composite Score(s)

- **High:** 19–24
- **Medium:** 16–18
- **Low:** N/A–15

Priority Refinement:

2.) Current TFP/CIP Projects

3.) Projects specifically required to implement future FTN route structure

- Project L19: NE 6th St Extension
- Project L27: Bellevue College Connection

4.) Projects for which the Transportation Commission has provided specific guidance

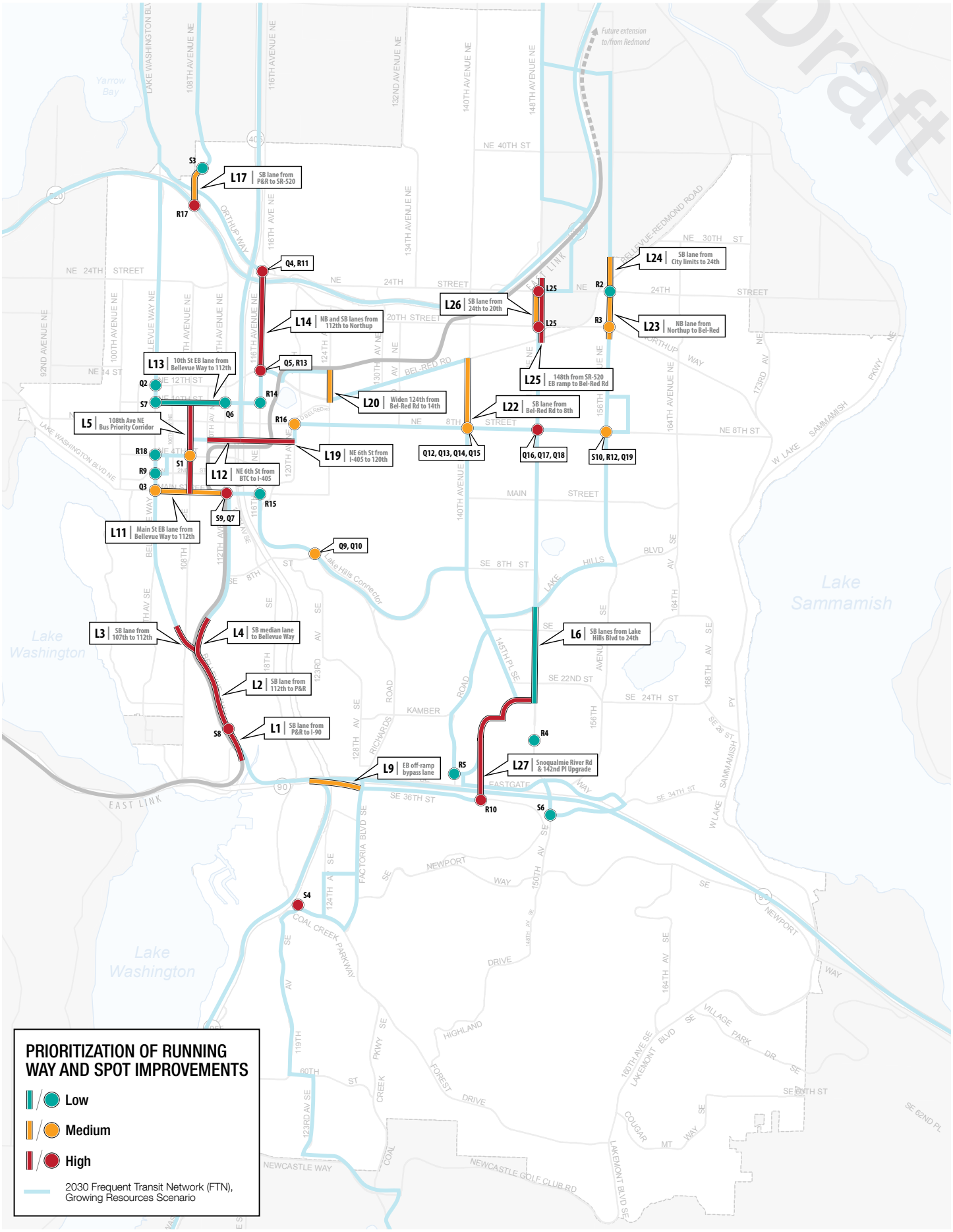
- Project L27: Bellevue College Connection
- Project L11: Main St HOV Lane
- Project L13: NE 10th St HOV Lane

Table 21 Summary of long-term project prioritization.

Long-Term Project Prioritization	Total Projects	Project Type	
		Running Way	Spot Improvement
High	20	10	10
Medium	21	8	13
Low	17	2	15
Total	58	20	38

Note: Both the running way and spot improvement categories each include one more project than these categories do in Table 4 on page 20 because each includes one tracking project (L12 and R17, respectively).

Figure 139 Prioritization of the proposed transit running way, spot improvement, and location-specific tracking projects.



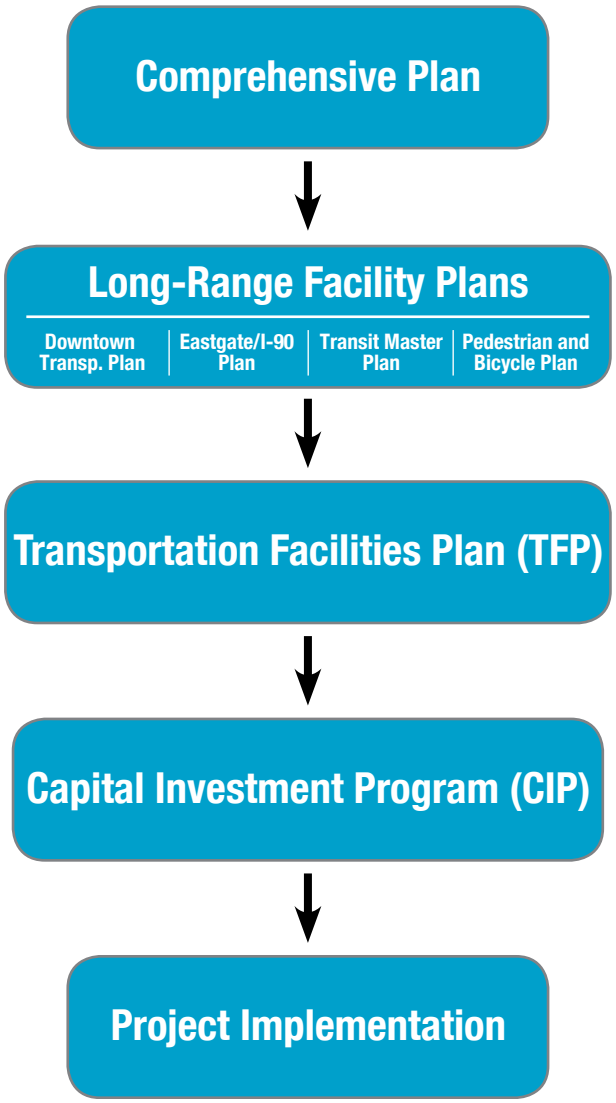
Draft

Figure 140 The transportation planning process.

The project prioritization presented here is only the first step in the multi-stage process from transportation project inception to implementation.

The next step for projects proposed by the Transit Master Plan and other long-range facility plans is typically adoption by the Transportation Facilities Plan (TFP), which reflects a comprehensive, citywide study that collects the priority projects identified by long-range plans that are projected to be implemented over a twelve-year period.

The highest priority capital projects (including Parks, Utilities, and other capital facilties) are incorporatied into the Capital Investment Program (CIP). The CIP reflects funding required to implement projects over a seven-year period and is updated every two years by the City Council through the biennial budget update process. Transportation projects funded in the CIP represent those identified in the TFP that are likely to be needed in the short term from the time of their inclusion.



and avoiding more congested intersections through which routes would otherwise have to travel.

The final priority refinement consideration relates to input received from the Transportation Commission during the Capital Element planning process. Unlike the other two refinement categories, this consideration could increase or decrease a project's base priority, depending on the direction provided by Commission. For example, the Commission has expressed particular interest in pursuing the Bellevue College Connection (Project L27) for a variety of reasons, such as its ability to significantly improve travel time and route directness while maintaining service to Bellevue College, its improvement of non-motorized connections to the Mountains to Sound Greenway Trail, and the potential for this project to compete for funding as part of the Sound Transit 3 (ST3) system expansion program. If the Bellevue College Connection project had not already been elevated to High Priority by the previous refinement considerations, it would have been by this one. Conversely, following an in-depth micro-simulation analysis, Projects L11 and L13 (HOV lanes on Main St and NE 10th St, respectively) were considered to provide a relatively small benefit despite similar costs to some other HOV/BAT lane projects. Therefore, although these projects were initially identified as having High and Medium Priority, respectively, on the basis of their composite scores, both were reduced one level (to Medium and Low Priority, respectively).

Project costs were not considered as a factor in the prioritization of projects because it is believed that this should be determined based solely on the projects' merits and projected benefits, rather than on whether they might be convenient to fund. That is, an expensive project is not inherently less worthy of pursuit, nor is an inexpensive project more worthy. See Appendix Table 29 on page A305 for a chart that identifies the long-term prioritization and estimated costs for all running way and spot improvement projects.

Draft

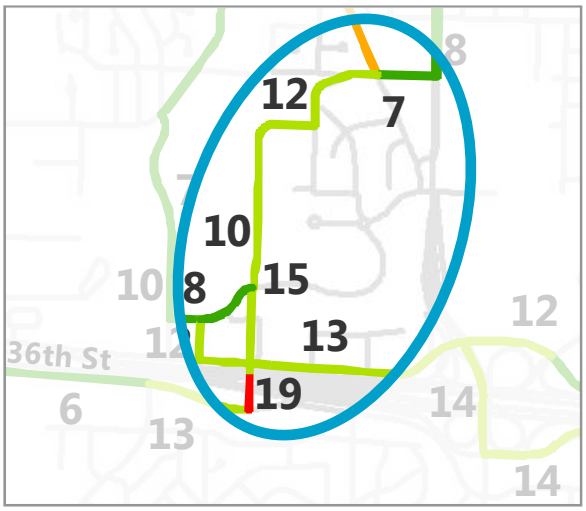
Project Prioritization Examples

Project L27: Bellevue College Connection

Final Project Priority: **High**

1.) Long-Term Corridor Composite Score(s)

- Range of 7–19, or a simple average of 13.
- Initial Priority Assigned: **Low**



2.) Is it a current TFP/CIP project?

- Yes. It is included in the TFP as TFP-252.
- Priority increased to **Medium**

3.) Is the project specifically required to implement the future FTN route structure?

- Yes. Without this project, a different route structure would be required between Eastgate and Bellevue College, which would require additional platform hour resources to operate and thus necessitate revisions to service coverage, frequency, or span.
- Priority increased to **High**

4.) Did the Transportation Commission provide specific guidance about the project?

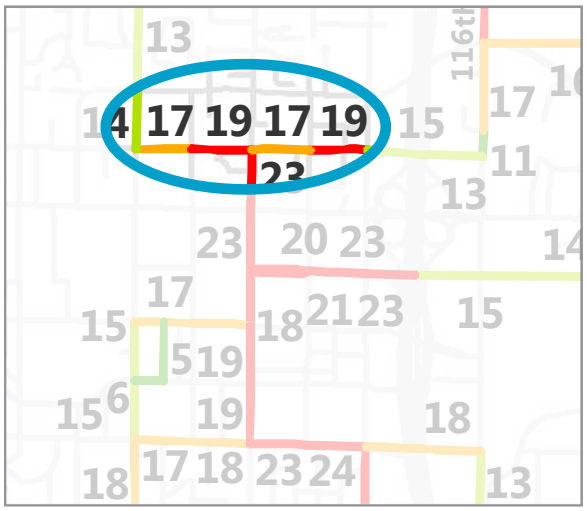
- Yes. The Commission considered this to be a particularly beneficial project that should be pursued as soon as possible.
- Priority would be increased if it were not already identified as High.

Project L13: NE 10th St HOV Lane

Final Project Priority: **Low**

1.) Long-Term Corridor Composite Score(s)

- Range of 17–19, or a simple average of 18.
- Initial Priority Assigned: **Medium**



2.) Is it a current TFP/CIP project?

- No. Priority remains **Medium**

3.) Is the project specifically required to implement the future FTN route structure?

- No. Buses will be able to use NE 10th St without implementation of this HOV lane project.
- Priority remains **Medium**

4.) Did the Transportation Commission provide specific guidance about the project?

- Yes. Based on the results of a micro-simulation analysis, the Commission considered this project to provide relatively minimal travel time benefits relative to similar projects being considered, and its conversion of a general purpose travel lane could be controversial, even though all modes realize time savings.
- Priority reduced to **Low**

Draft

Short-Term Project Prioritization Criteria

Base Priority Identification:

1.) Short-Term Corridor Composite Score(s)

- **High:** 20–32
- **Medium:** 16–19
- **Low:** N/A–15

Priority Refinement:

2.) Current TFP/CIP Projects

Table 22 Summary of short-term supplemental project prioritization.

Short-Term Supplemental Prioritization	Total Projects	Project Type	
		Running Way	Spot Improvement
High	18	6	12
Medium	16	5	11
Low	24	9	15
Total	58	20	38

Note: Both the running way and spot improvement categories each include one more project than these categories do in Table 4 on page 20 because each includes one tracking project (L12 and R17, respectively).

Short-Term Supplemental Prioritization

The prioritization process described on the preceding pages will serve as the primary means by which potential projects are advanced for consideration for inclusion in the Transportation Facilities Plan (TFP) and Capital Investment Program (CIP) over the twenty-year implementation period of the Transit Master Plan. However, that prioritization process is based on long-term composite scores, which reflect the issues and needs identified for the 2030 Frequent Transit Network. Although the 2015 and 2022 Frequent Transit Networks identified by the *Transit Service Vision Report* are designed to incrementally move the route structure towards that of the 2030 FTN, some notable differences exist between the near- and long-term plans.

Therefore, in order to assist with the identification of projects in the current budget cycle, which would advance projects for implementation in the short-term based on available city resources and grant funding eligibility, projects have also been prioritized on the basis of their short-term composite scores. Unlike the long-term prioritization, which also included a three-step priority refinement process to reflect several other considerations, the short-term project prioritization considers only one factor in revising the base priority: a project's existing inclusion in the current TFP and/or CIP. Table 22 provides a summary of the short-term project prioritization rankings; refer to Appendix Table 30 on page A306 for a chart that identifies the short-term supplemental prioritization for all running way and spot improvement projects by estimated cost.

Because the short- and long-term composite scores are calculated using different metrics, some projects are assigned different priorities in the short-term than they are in the long-term. The 156th Ave Business Access and Transit (BAT) lane projects

(Running Way Projects L23 and L24) provide an example of such variation. In the short-term, Project L23 is identified as High Priority, but in the long-term it is ranked Medium Priority. This reduction in priority over time is a result of long-term network restructuring, which locates fewer routes along this corridor and consequently serves relatively fewer riders—both factors that contribute to the composite scores. However, pursuing these BAT lane projects would benefit the RapidRide B Line and Routes 226 and 245 in the short-term and proposed FTN Routes 3 and 7 and Coverage Route 36 in the mid-term (2022). Further, although relative bus volumes along 156th Ave NE will decrease as the high-frequency grid network structure is implemented by 2030—thereby shifting some currently overlapping services to parallel corridors—approach delay, queue length, and intersection level of service (LOS) all remain significant long-term issues that these BAT lane projects would continue to address after implementation of the 2030 FTN. Thus, while the long-term project prioritization may not suggest that Projects L23 and L24 should be among the highest-priority projects to pursue, the short-term prioritization indicates that they are among the highest-priority in the years prior to 2030, and they will continue to provide value after 2030 as well.

Draft

TRANSIT RUNNING WAY IMPROVEMENTS

Figure 141 Running Way Improvement Projects L2, L3 and L4: Median HOV lanes on Bellevue Way SE and 112th Ave SE would improve the movement of transit vehicles through this congested Y-intersection southbound to South Bellevue Park-and-Ride. This would be achieved by constructing one lane on Bellevue Way SE and constructing a new median lane on 112th Ave SE. Aerial images depict roadway striping before and after lane reconfiguration. This concept maintains all existing general purpose travel lanes.

Nineteen projects related to transit running ways are being proposed, including the conversion or restriction of general purpose travel lanes and the construction of new lanes for transit (see Figure 143 and Table 23 on the following pages). Potential improvements include High-Occupancy Vehicle (HOV) lanes and Business Access and Transit (BAT) lanes along several Frequent Transit Network (FTN) corridors. Some notable projects include HOV lanes along several segments of Bellevue Way SE and 112th Ave SE (see Figures 136, 141, and 142), BAT lanes and/or other speed and reliability improvements along 108th Ave NE in Downtown, HOV lanes along NE 10th St (see Appendix D5 on page A252), Main St, and the NE 6th St Extension (see Figure 145), and an upgrade of Snoqualmie River Rd through the Bellevue College campus so that it can accommodate bus traffic (see Appendices D7on page A275).

Figure 141 depicts an early conceptual rendering of how three HOV lane projects (L2, L3, and L4) might be included in the street right-of-way along Bellevue Way SE and 112th Ave SE (see also Figure 142). These treatments are meant to improve travel time for southbound buses through this Y-intersection to the South Bellevue Park-and-Ride (see Appendix D4 on page A251 for 2030 travel time and person and vehicle throughput/volume analysis). Project L2 between the Y-intersection and the park-and-ride was included in Sound Transit's *East Link Extension Cost Savings Work Plan Findings* report in September 2012, but it has since been separated from any improvements being made for East Link by Sound Transit. This corridor ranks among those with the greatest need in the short-term and long-term based on the results of the issue identification process, but it remains a sensitive topic among some members of adjacent neighborhoods. Funding has already been secured for

Draft

project L1 from the park-and-ride south to I-90 in the 2011 Memordanum of Understanding (MOU) between the City and Sound Transit, and it will be constructed by Sound Transit as part of the East Link project.

Consistent with the Downtown Transportation Plan Update, the *Transit Service Vision Report* proposes that many key routes follow 108th Ave NE through the length of Downtown. BAT lanes and/or other speed and reliability improvements are proposed along 108th (Project L5) to accommodate the significant volume of services that will use this Downtown transit spine, which ranks among the corridors

Figure 142 Running Way Improvement Projects L2: A southbound median HOV lane on Bellevue Way SE would improve the speed and reliability of transit vehicles between 112th Ave SE to South Bellevue Park-and-Ride. This would be achieved by constructing one lane on Bellevue Way SE, thereby maintaining all existing general purpose travel lanes. Aerial images depict roadway striping before and after construction.

Figure 143 Map of potential transit running way projects.

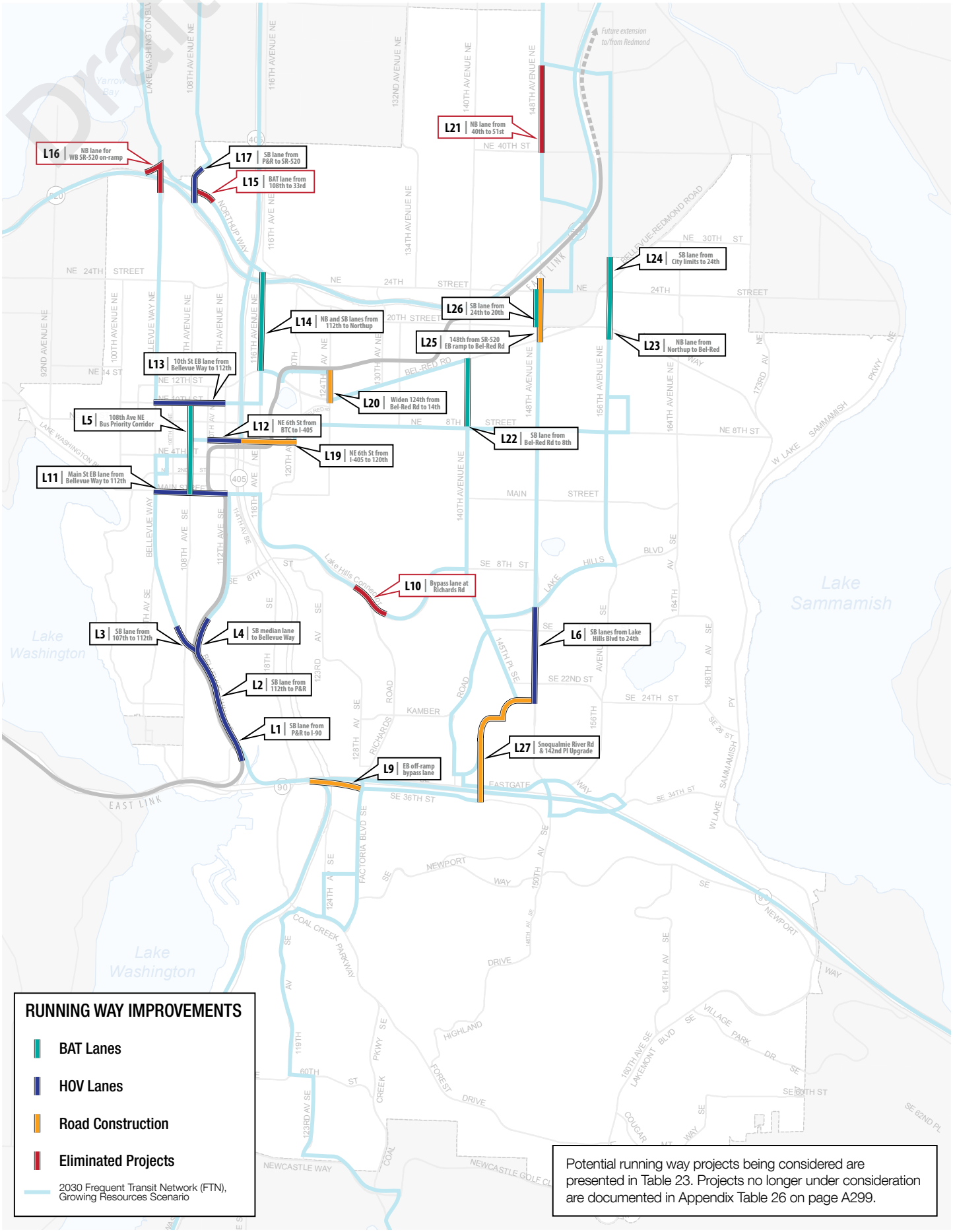


Table 23 Potential transit running way projects.

ID	Project	Type	FTN Service		Project Description	Composite Scores		Project Need / Potential Issues	Cost Range
			Routes	Frequency (Peak/Base/Night)		Short-Term	Long-Term		
L1	Bellevue Way SE HOV Lane - South Bellevue P&R	Lane Construction	1, 3, 11	~3 / 3-4 / 5-6	Construct a southbound HOV Lane on Bellevue Way SE between South Bellevue Park-and-Ride and I-90.	19	22	Previously noted in multiple plans including East Link Cost Saving Negotiations, Bellevue Transit Plan, Bellevue Transit Improvement Analysis, and Transportation Facilities Plan. See TIP-54 and TFP-242.	$$$
L2	Bellevue Way SE HOV Lane - South Bellevue P&R Extension	Lane Construction	1, 3, 11	~3 / 3-4 / 5-6	Construct a southbound HOV lane on Bellevue Way SE between South Bellevue Park and Ride and Y intersection with 112th Ave.	17–24	23	Previously noted in Bellevue plans. See TIP-55 and TFP-242.	$$$
L3	Bellevue Way SE HOV Lane - 112th Ave SE Extension	Lane Conversion/ Restriction	3, 11	4 / 5-8 / 15-20	Construct a southbound median HOV Lane on Bellevue Way SE from 112th Ave SE to approximately 107th Ave SE.	13–15	16–22	Addresses operator feedback, 2030 LOS of E and 2030 queuing, and frequent service. Property impacts on the west side of Bellevue Way SE at the intersection with 112th Ave SE.	$$$
L4	112th Ave SE HOV Lane	Lane Construction	1	8 / 10-15 / 30	Construct a southbound median HOV Lane on 112th Ave SE from Bellevue Way SE to slightly beyond end of intersection queue.	13	19	Addresses operator feedback, 2030 LOS of E and 2030 queuing. See TFP-242. Property impacts on the west side of Bellevue Way SE at the intersection with 112th Ave SE.	$$$
L5	108th Ave NE Transit Corridor	Lane Restrictions	1, 2, 3, 5, 6, 11, 13	~1 / 1-2 / ~2	Convert existing lanes along 108th Ave NE into BAT lanes and/ or implement other speed and reliability treatments as identified by the Downtown Transportation Plan Update from NE 10th St to Main St.	16–27	19–23	Very high bus volumes, revised circulation patterns, increased bus layover needs, and higher passenger boarding/alighting volumes will require additional transit capacity. Previously noted in several plans including the Downtown Transportation Plan Update, Bellevue Transit Plan, and Bellevue Transit Improvement Analysis. See TIP-51 and TFP-230 .	$$
L6	148th Ave SE Improvements - Bellevue College	Lane Construction	12	8 / 10 / 15	Construct a southbound HOV lane and transit queue jump lanes and install TSP on 148th Ave SE between Lake Hills Blvd and SE 24th St.	7–15	8–9	Previously noted in the Bellevue Transit Plan. See TIP-66.	$$$
L9	I-90 Factoria Blvd Exit Expansion	General Purpose Lane Construction	11	8 / 10 / 15	In coordination with the Mountains to Sound Greenway, relocate the current trail undercrossing of the ramp between northbound I-405 and eastbound I-90 to a new bridge south of the existing undercrossing, and add a second off-ramp lane to the current ramp undercrossing. Evaluate how to best stripe the off-ramp lanes to ensure reliable transit operations.	22	16	Addresses 2010 intersection LOS of E and queuing issues. Could be funded in coordination with TIP-35, CIP W/B-78, and TFP-243.	$$$
L11	Main St HOV Lane	Lane Restriction	1, 13	4 / 5-8 / 15-20	Convert one eastbound general purpose lane to a PM peak-only HOV lane on Main St from Bellevue Way NE to 112th Ave NE.	9–11	23–24	Addresses 2030 intersection LOS of E/F at multiple intersections as well as significant queuing issues.	$$
L13	NE 10th St HOV Lane	Lane Restrictions	5	8 / 10 / 15	Convert one eastbound general purpose lane to a PM peak-only HOV lane on NE 10th St from Bellevue Way NE to 112th Ave NE.	9–16	17–19	Addresses LOS of E at one intersection and long queues at multiple intersections in 2030.	$$
L14	NE 116th Ave NE BAT Lanes	Lane Restrictions	5, 14	4 / 5 / ~8	Modify the channelization to allow BAT lanes between NE 12th St and Northup Way when approaching intersections and/or implement other speed and reliability treatments.	17	24	Addresses LOS of F and long intersection queues at north end of corridor. Very frequent service on corridor.	$$
L17	108th Ave HOV Lanes	Lane Construction	4, 5, 14	~3 / 3-4 / 5-6	Construct a southbound lane for SR-520 westbound traffic and restrict the second lane for SR-520 eastbound and HOV traffic between the SR-520 direct access ramps and the South Kirkland Park-and-Ride.	16–30	14–23	Addresses current and future LOS issues (E and F respectively Very frequent service on this segment. This project represents an expansion by one lane of the intersection's north approach relative to the reconfiguration project currently being implemented by WSDOT as part of the SR-520 Bridge Replacement and HOV Program. Further analysis is required prior to the advancement of this project to ensure effective coordination with the changes currently being made.	$$$
L19	NE 6th St Extension	Road Extension	2, 6	4 / 5-8 / 15-20	Conduct a pre-design analysis for the extension of NE 6th St from its current terminus in the median of I-405 to the east over the northbound lanes of I-405 and 116th Ave NE to a new intersection with 120th Ave NE. Evaluate for additional transit improvements.	17	15	Addresses delay associated with signalized turns. Previously noted in the Bellevue Capital Investment Program and Transportation Facilities Plan. See TIP-14, CIP R-162, and TFP-211.	$
L20	124th Ave NE - Bel-Red Road to NE 14th Street	Road Upgrade	14	8 / 10 / 15	Complete a preliminary design for the widening (to 5 lanes) of 124th Ave NE from Bel-Red Rd to NE 14th St. Coordinate with PW-R-166. Evaluate for additional transit improvements.	3	14	Addresses delay associated with signalized turns. Previously noted in the Bellevue Capital Investment Program and Transportation Facilities Plan. See TIP-18, CIP R-169, and TFP-213.	$
L22	140th Ave NE BAT Lane	Lane Construction	14	8 / 10 / 15	Construct a southbound BAT lane from Bel-Red Rd to NE 8th St.	9	16	Addresses future LOS of F as well as significant queuing.	$$$
L23	156th Ave NE BAT Lane - Northbound	Lane Construction	7	8 / 10 / 15	Construct a northbound BAT lane from south of Northup Way to just north of NE 24th St.	17–27	17–18	Addresses future LOS and queue length issues at multiple intersections.	$$$
L24	156th Ave NE BAT Lane - Southbound	Lane Construction	7	8 / 10 / 15	Construct a southbound BAT lane from City Limits to just south of NE 24th St.	15–17	16–18	Addresses future LOS and queue length issues at multiple intersections.	$$$

Note: These projects are conceptual and the final details of design will be developed as the projects proceed further along in the implementation process.

Table 23 continued.

ID	Project	Type	FTN Service		Project Description	Composite Scores		Project Need	Potential Issues
			Routes	Frequency (Peak/Base/Night)		Short-Term	Long-Term		
L25	148th Avenue NE Master Plan Improvements	Road Upgrade	12	8 / 10 / 15	Construct the following: – A third NB through lane on 148th Ave NE from 350 ft south of Bel-Red Rd to the SR-520 eastbound on-ramp; – NB right turn lane and EB/WB dual left turn lanes at 148th Ave NE/Bel-Red Rd; – EB/WB dual left-turn lanes at NE 20th St/148th Ave NE; – Extend NB and WB right turn lanes at NE 24th St/148th Ave NE; – EB and WB dual left-turn lanes at NE 24th St/148th Ave NE; – Configure the NB three-lane approach on 148th Ave NE at the SR-520 eastbound on-ramp to right-turn only.	11–13	15–18	Investigate how improvements can be implemented to prioritize HOV and transit. Previously noted in the Transportation Facilities Plan. See TIP-61 and TFP-250.	$$$
L26	148th Ave NE BAT Lane - Overlake	Lane Construction/ Restriction	12	8 / 10 / 15	Modify the channelization to allow BAT lanes on 148th Ave NE between NE 24th St and NE 20th St.	11–13	15–18	Addresses future LOS of F for multiple intersections.	$$
L27	Bellevue College Connection: 142nd Pl SE/ Snoqualmie River Road Multimodal Corridor	Road Upgrade	14	8 / 10 / 15	Upgrade the Snoqualmie River Rd roadway surface and facilities to support very frequent transit service. Includes stronger road surface, sidewalks, bicycle facilities, bus stops, and parking relocation components. Non-motorized improvements to the NE 142nd Pl SE bridge are also included.	15–19	7–19	Previously noted in the Eastgate/I-90 Land Use and Transportation Project. See TIP-63 and TFP-252.	$$$

Note: These projects are conceptual and the final details of design will be developed as the projects proceed further along in the implementation process.

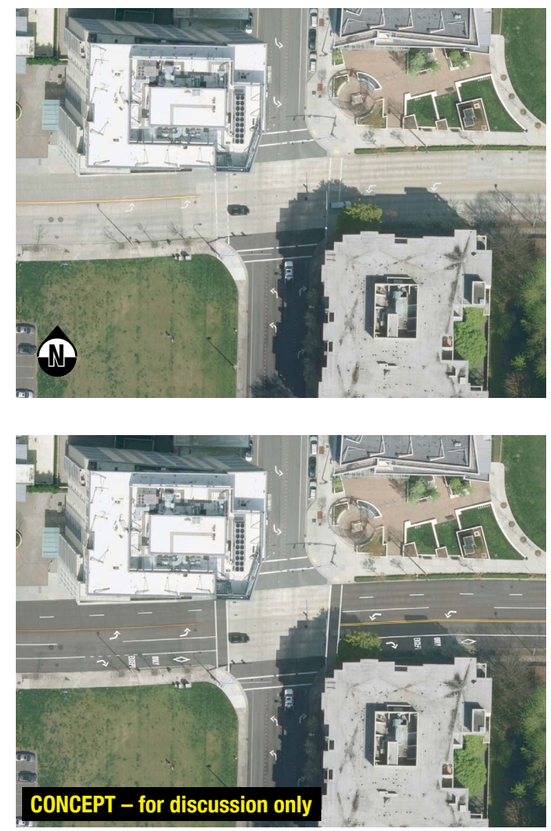


Figure 144 Running Way Improvement Project L13: PM peak-only HOV lane on NE 10th St for eastbound buses between Bellevue Way NE and NE 112th St. Aerial images depict roadway striping before and after lane reconfiguration.

with the greatest long-term needs for speed and reliability investments based on projected ridership, bus volumes, approach delay, and queue length (see Appendix D3 page A232). As a complement to the 108th corridor improvements, eastbound HOV lanes are being considered along NE 10th St (see Figure 144) and Main St between Bellevue Way and 112th Ave NE to address approach delay and queue length issues, as well as high bus volumes and projected ridership. Both HOV projects would convert an existing travel lane during PM peak hours only. See Appendix D5 on page A252 for the results of a Vissim micro-simulation traffic model analysis of these Downtown HOV lane projects.

Another important project assumed by the *Transit Service Vision Report* to be complete by 2030 is the NE 6th St HOV Extension, which is already included in Bellevue's Capital Investment Program (Project L19; see Figure 145). This project will extend the existing NE 6th St HOV direct access ramp bridge from the center of I-405 east to 120th Ave NE. This would make it possible to remove all transit services from NE 8th St west of 120th Ave NE, thereby bypassing multiple intersections with long approach queues, delays, and

poor level-of-service (LOS) associated with general purpose traffic entering and exiting I-405.

Projects L23 and L24, both pictured in Figure 146, provide examples of how BAT lanes would be implemented in Bellevue, in this case on 156th Ave NE. Project L23 is a northbound BAT lane that extends from just south of Northup Way to just north of NE 24th St, while Project L24 is a southbound BAT lane extending from the city limits to just south of NE 24th St. Both of these projects involve the construction of an additional lane to address long queue lengths and an LOS of 'E' and 'F' at multiple intersections along this segment in 2030. Because these projects are BAT lanes, the additional road capacity would primarily benefit transit, but by providing right-turn access to businesses for general purpose traffic, these projects would also benefit private vehicles by moving turning vehicles out of the general purpose travel lanes.

Another project specifically noted by the *Transit Service Vision Report*—and previously proposed by the *Eastgate/I-90 Transportation Strategies Report*—is an upgrade of Snoqualmie River Rd, which is a central factor in increasing service frequency and reliability through Bellevue College. This project (L27) involves improving the roadway surface to be capable of supporting very frequent bus service, new bus stops, and associated pedestrian and bicycle facilities. Without this improvement, long route deviations would continue to be required to serve both Bellevue College and the Eastgate Park-and-Ride, resulting in an unreasonable waste of limited transit resources and a likely need to reconsider the route structure in the Eastgate area. See Appendix D6 on page A263 and D7 on page A275 for a preliminary design concept to improve circulation to and through the campus for transit, pedestrians, and bicyclists.

Also being considered is a unique roadway project that would relocate a portion of the Mountains to Sound Greenway Trail and expand the I-90 eastbound off-ramp roadway to two lanes (Project L9; see

Figure 145 Running Way Improvement Project L19: Artist rendering of East Link LRT integrated with the NE 6th St HOV Extension.

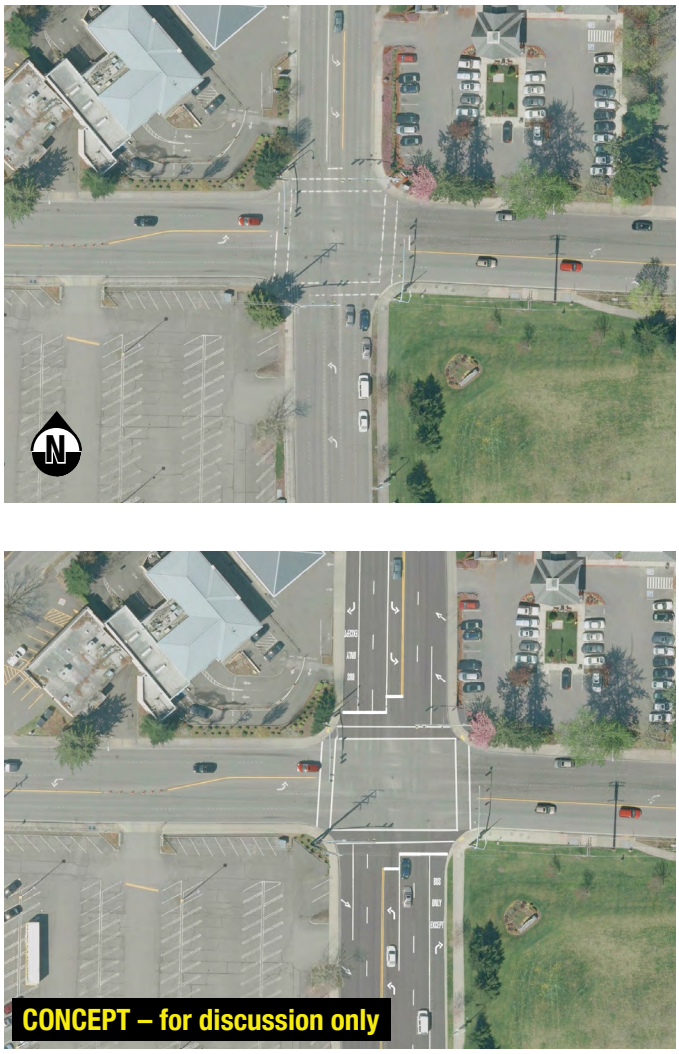


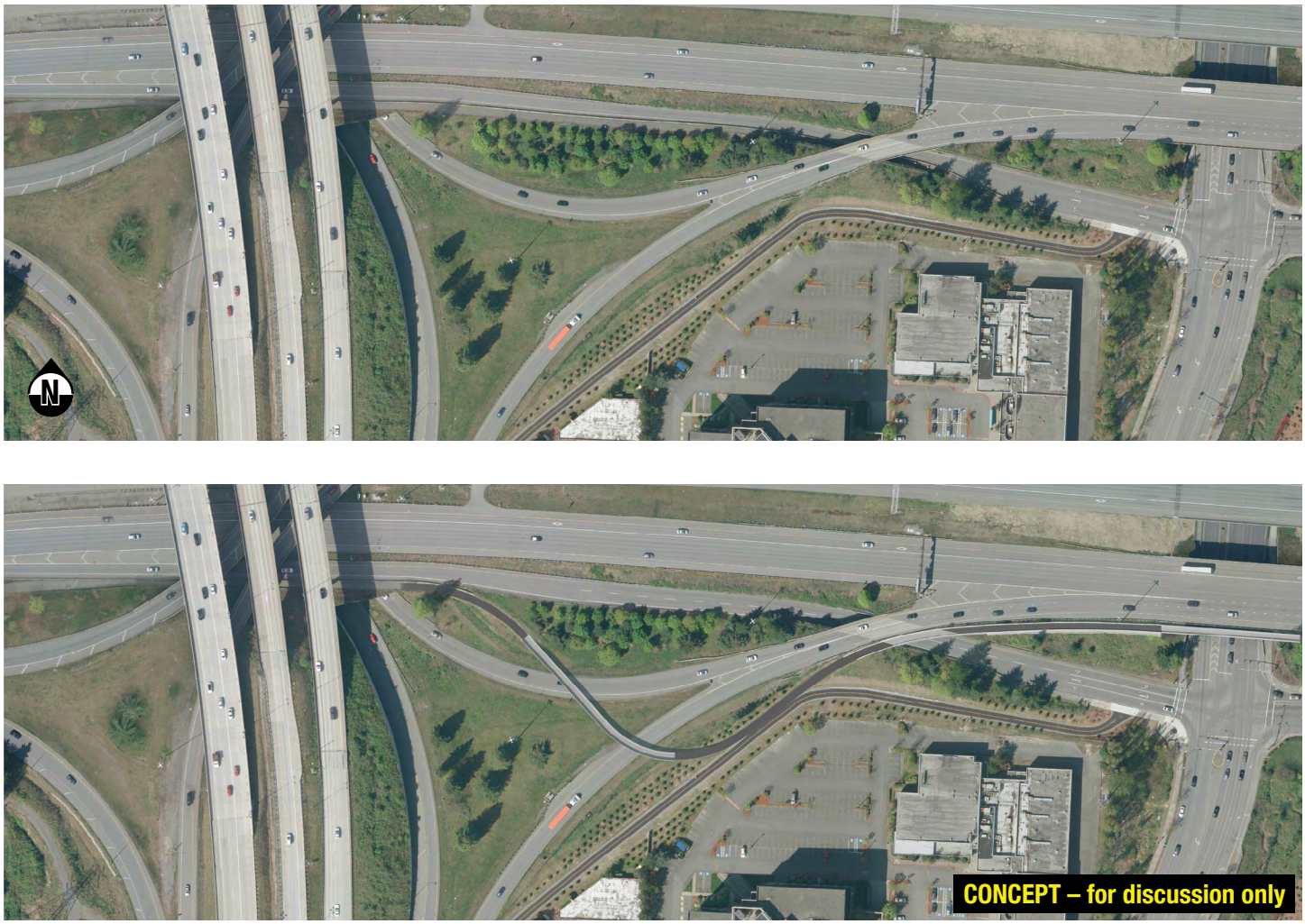
Figure 146 Running Way Improvement Projects L23 and L24: BAT lanes would be constructed on 156th Ave NE northbound from Northup Way to NE 24th St and southbound from city limits to NE 24th St, respectively. Aerial images depict roadway striping before and after lane reconfiguration. These concepts both maintain all existing general purpose travel lanes.

Draft

Figure 147). Presently, the off-ramp diverges from one lane to three in the short distance between the underpass and the intersection with Factoria Blvd, causing long queues, signal operation issues, and a PM peak LOS of 'E'. Widening the existing bridge to accommodate both an additional lane and the trail would be expensive, but the existing pavement width passing under the bridge is sufficiently wide to accommodate two vehicular travel lanes if the trail is relocated. The concept design shown in Figure 147 considers constructing a bridge for the trail that spans both I-405 ramps to I-90 eastbound, which also facilitates a direct connection from the Greenway Trail to the existing Factoria Trail before continuing east adjacent to I-90. This would improve the Greenway Trail while simultaneously alleviating delays to transit and general purpose traffic exiting I-90 eastbound to Factoria. As such, funding for Project L9 could be pursued in coordination with the ongoing Mountains to Sound Greenway Trail project (TFP-243). Further study is required to determine how to best utilize the additional lane to the benefit of transit and other road users.

Although the Transit Priority Toolbox (pages 107 through 121) includes improvements that afford transit greater operational exclusivity—treatments like bus-only lanes and transit-only streets—no such projects are included in this list.

Figure 147 Running Way Improvement Project L9: The eastbound I-90 off-ramp would be widened from one lane to two by relocating the Mountains to Sound Greenway Trail. This project would help reduce signal and queuing delay caused by the signal at Factoria Blvd, helping both transit and general purpose traffic.



SPOT IMPROVEMENTS

Thirty-nine spot improvement projects are currently being considered, including sixteen queue jump lanes, thirteen intersection or roadway improvement projects, and ten signalization improvement projects. Intersection and roadway projects relate primarily to turning movements and include improvements to turn radii and the construction of new turning lanes. Signalization improvements relate primarily to adjusting signal timing to increase the amount of green time allocated to movements operated by FTN routes, but they also include some turn restrictions on general purpose traffic during peak hours and improvements to the responsiveness of existing TSP controllers.

Queue Jumps

Queue jumps can be implemented in one of three basic configurations, as shown in Figure 150. Which variant is pursued for any given project depends primarily on the amount of right-of-way available on the near and far sides of the intersection. Queue jumps require either a complimentary lane on the far-side of the intersection (right diagram) or TSP treatment to allow buses to advance through the intersection before general purpose traffic (left and center diagrams). Where permitted by the amount of right-of-way available, it is operationally preferable to use a designated queue jump lane with an advance green signal, as shown by the left and right diagrams. The alternative depicted by the center diagram involves restriction of the right lane so that only transit vehicles can continue through the intersection; for general purpose traffic, it becomes a right-turn only lane. This latter configuration is less desirable both because it removes a through-lane from general purpose traffic and because of the potential for buses to be caught behind a queue of right-turning vehicles, reducing the benefit afforded to transit by the queue jump.

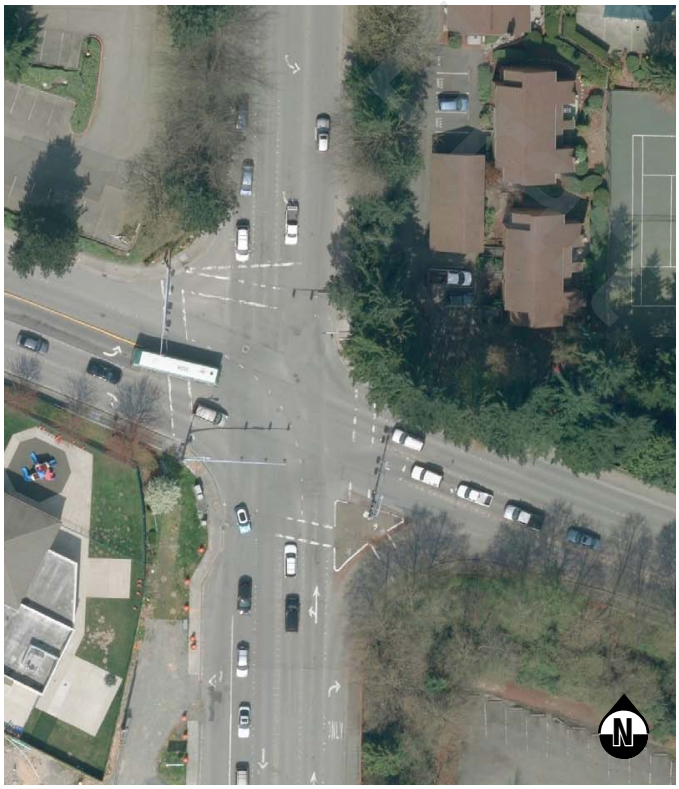


Figure 148 Running Way Improvement Project L17: Construction of a southbound HOV lane on 108th Ave NE between South Kirkland Park-and-Ride and SR-520. Aerial images depict roadway striping before and after lane reconfiguration. This concept adds one lane to the north approach relative to the WSDOT intersection reconfiguration currently being implemented. A northbound queue jump lane was also previously being considered at this intersection (see Project Q4 on page A301), but it is no longer being considered because it cannot be accommodated by WSDOT's plans.

Figure 149 Spot Improvement Project Q5: Queue jump lane on NE 116th St for left turning, northeast-bound traffic at Northup Way. Aerial images depict roadway striping before and after lane reconfiguration. This concept maintains all general purpose travel lanes and requires no new lane construction—both suitable qualities for a potential 'quick win' project.

Although the conceptual visualizations presented here reflect one of these three configurations, this does not imply that there is only one way to implement a queue jump at a given location. Specific queue jump configurations have not yet been determined for any of the potential projects, but the conceptual renderings indicate one possibility. As queue jump projects are advanced through feasibility screening and project prioritzation, potential design strategies will be assessed based on signal operations, right-of-way availability, and constructability restrictions.

Some notable queue jump projects being considered include one on 116th Ave NE for northbound buses turning west (left) onto Northup Way (see Figure 149) and two for nothbound traffic on Bellevue Way NE—one at Main St and another at NE 12th St. A potential queue jump for northbound buses on 108th Ave NE at Northup Way, considered in the *Draft Capital Element Background Report (Volume 1: Speed and Reliability)*, was removed from the project list due to space constraints created by the SR-520 Bridge Replacement and HOV Project (see Appendix 7 page A301).

Intersection & Roadway Improvements

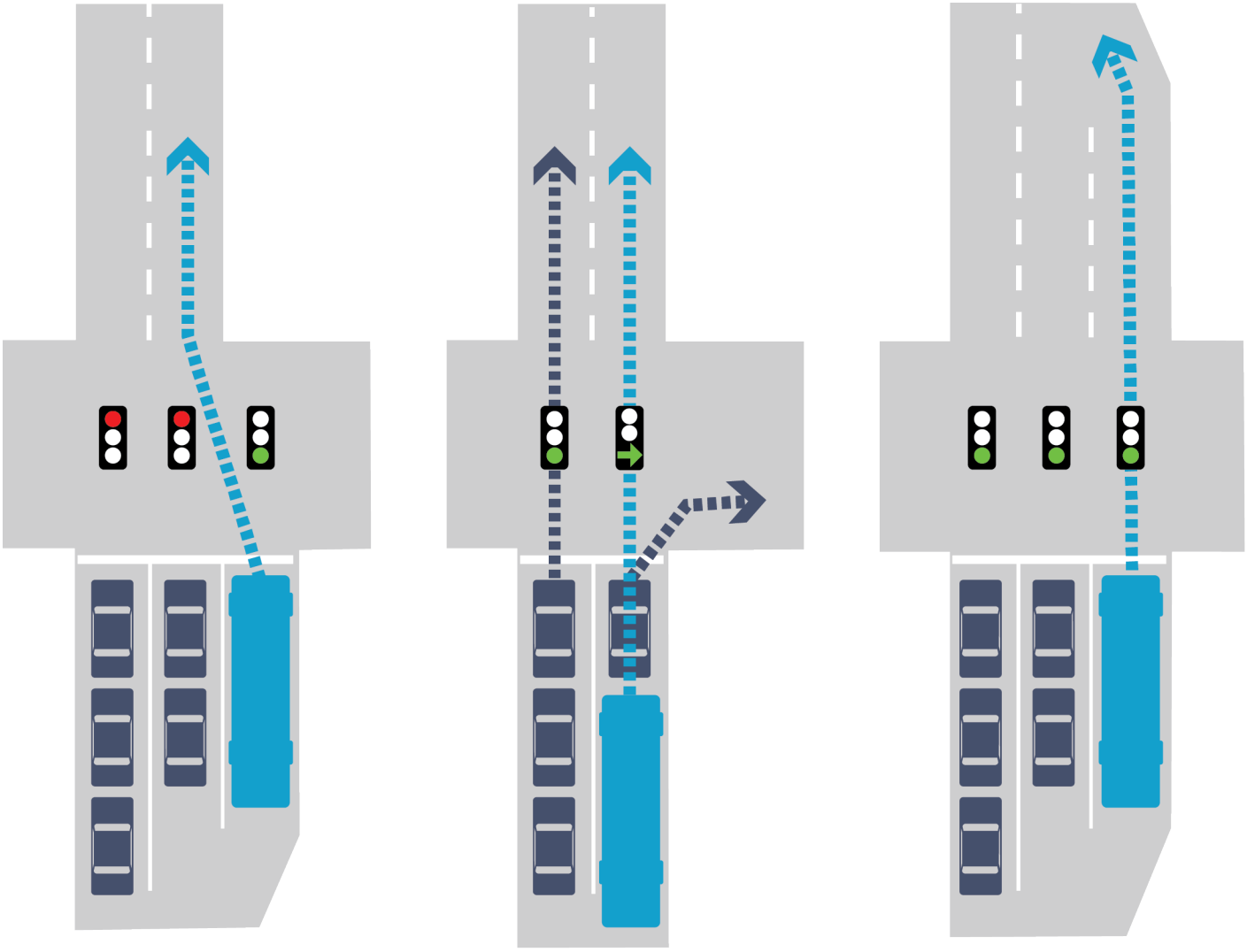
All but one of the potential intersection and roadway improvement projects deal with improving turn radii to better accommodate buses or adding new turn lanes to increase traffic flow and help buses pass through intersections more reliably in a single signal cycle. The only project that does not fall into these two categories (R14) simply seeks to improve the clarity of the existing channelization on NE 10th St. No negative impacts to general purpose traffic are anticipated from these improvements, as any right-of-way adjustments are lane additions, not conversions, and are not restricted to use by HOVs or buses.

Signalization Improvements

Signalization improvements relate primarily to extending the length of green phases associated with troublesome transit turning movements, either by adjusting normal signal timings or improving existing TSP controller responsiveness. New TSP implementation projects are categorized separately and are addressed in the following section. Two city-wide projects are also being considered—one to upgrade any non-SCATS traffic signals to that system, and another to coordinate with Metro to establish standards for TSP equipment and software.

Draft

Figure 150 Various configurations of queue jump lanes.

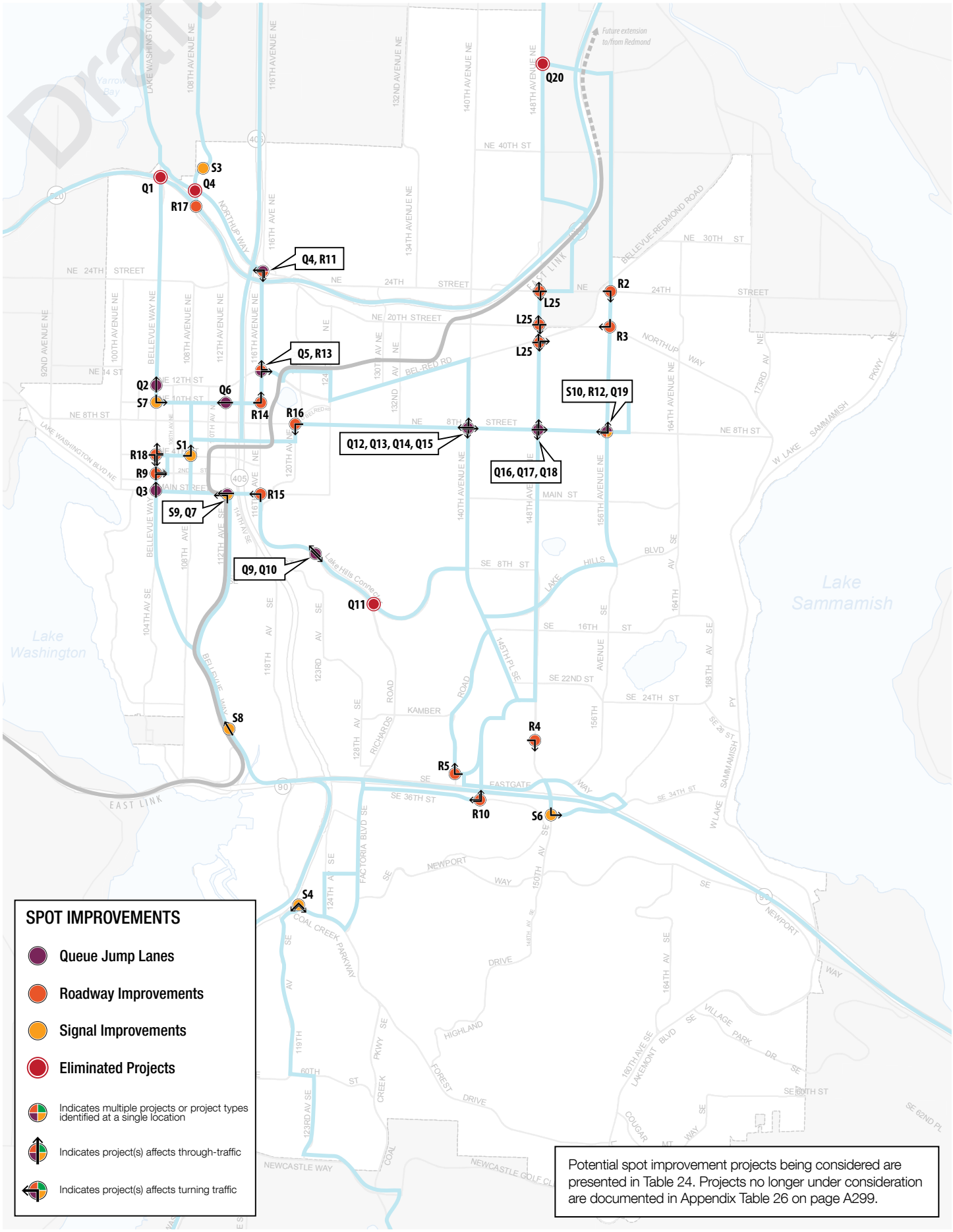


Queue Jump through Advanced Green Signal

Queue Jump through Transit Vehicle Exception

Queue Jump through Transit Receiving/Merge Lane

Figure 151 Potential spot improvement projects.



Potential spot improvement projects being considered are presented in Table 24. Projects no longer under consideration are documented in Appendix Table 26 on page A299.

Table 24 Potential queue jump, intersection, roadway, and signalization projects.

ID	Project	Type	FTN Service		Project Description	Composite Scores		Project Need / Potential Issues	Cost Range
			Routes	Frequency (Peak/Base/Night)		Short-Term	Long-Term		
Queue Jump Lanes									
Q2	Bellevue Way and NE 12th St - Northbound	Queue Jump	1	8 / 10-15 / 30	Add a queue jump to the northbound right turn lane.	13	14	High frequency transit service	$
Q3	Bellevue Way and Main St - Northbound	Queue Jump	3, 11	4 / 5-8 / 15-20	Modify channelization to allow a northbound queue jump.	24	18	Addresses operator comments and high bus volumes. Uses existing facilities to prioritize transit.	$
Q4	Northup Way and 116th Ave NE - Northbound	Queue Jump	2, 5, 14	2-3 / 3-4 / 8-10	Add a northbound to westbound queue jump lane.	17	24	Addresses future LOS and queuing issues, and very high bus volumes	$
Q5	116th Ave NE and NE 12th St - Southbound	Queue Jump	5, 14	4 / 5 / ~8	Add a queue jump without a far side lane to the northbound approach in the right-turn only lane.	17	24	Addresses high bus volumes	$
Q6	NE 10th St and 112th Ave NE - Westbound	Queue Jump	5	8 / 10 / 15	Add a queue jump to the westbound approach in the right-turn only lane.	11	15	Addresses future intersection LOS of E.	$
Q7	Main St and 112th Ave NE - Westbound	Queue Jump	1, 13	4 / 5-8 / 15-20	Add a queue jump to the westbound approach in the right-turn only lane.	11	24	Addresses future intersection LOS of F and significant queuing.	$
Q9	Lake Hills Connector and SE 8th St - Eastbound	Queue Jump	13	8 / 10 / 15	Add a queue jump to the eastbound approach in the right-turn only lane.	16	16	Addresses future intersection LOS of E and significant queuing.	$$
Q10	Lake Hills Connector and SE 8th St - Westbound	Queue Jump	13	8 / 10 / 15	Add a queue jump to the westbound approach in a newly constructed queue jump lane.	14	16	Addresses future intersection LOS of E.	$$
Q12	NE 8th Street and 140th Ave NE - Eastbound	Queue Jump	6	8 / 10 / 15	Add a queue jump to the eastbound approach in the right-turn only lane.	15	18	Addresses future intersection LOS of E and queuing.	$
Q13	NE 8th Street and 140th Ave NE - Northbound	Queue Jump	6, 14	4 / 5 / ~8	Add a queue jump to the northbound approach in a newly constructed queue jump lane.	9	16	Addresses future intersection LOS of E.	$
Q14	NE 8th Street and 140th Ave NE - Westbound	Queue Jump	6, 14	4 / 5 / ~8	Add a queue jump to the westbound approach in a newly constructed queue jump lane.	17	17	Addresses future intersection LOS of E.	$$$
Q15	NE 8th Street and 140th Ave NE - Southbound	Queue Jump	6, 14	4 / 5 / ~8	Add a queue jump to the southbound approach in the right-turn only lane.	9	16	Addresses future intersection LOS and significant queuing issues.	$
Q16	NE 8th St and 148th Ave NE - Eastbound	Queue Jump	6, 12	4 / 5 / ~8	Add a queue jump to the eastbound approach in the right-turn only lane.	19	15	Addresses operator comments. Right turn volumes might be too high to make this viable.	$
Q17	NE 8th St and 148th Ave NE - Northbound	Queue Jump	6, 12	4 / 5 / ~8	Add a queue jump to the northbound approach in the right-turn only lane.	20	14	Addresses operator comments.	$
Q18	NE 8th St and 148th Ave NE - Southbound	Queue Jump	6, 12	4 / 5 / ~8	Add a queue jump to the southbound approach in the right-turn only lane.	20	19	Addresses operator comments.	$
Q19	NE 8th St and 156th Ave NE (NB)	Queue Jump	6, 7	4 / 5 / ~8	Modify channelization to allow a queue jump.	21	14		$
Intersection and Roadway Improvements									
R2	156th Ave NE and NE 24th St Turn Radii	Turn Radii	7	8 / 10 / 15	Improve the turn radius for the eastbound right turn on 156th Ave NE at NE 24th St.	N/A	N/A	Previously noted in the Eastgate/I-90 Land Use and Transportation Project.	$$
R3	Northrup Way and 156th Ave NE Turn Radii	Turn Radii	7	8 / 10 / 15	Improve the turn radius for the southbound right turn on Northup Way at 156th Ave NE.	27	17	Previously noted in the Bellevue Transit Plan and Bellevue Transit Improvement Analysis.	$$
R4	Landerholm Circle and 148th SE Radii Improvements	Turn Radii	7, 13	4 / 5 / ~8	Improve the turn radius for the eastbound right turn on 148th Ave SE at Landerholm Circle.	N/A	N/A	Previously noted in the Bellevue Transit Plan and Bellevue Transit Improvement Analysis.	$$
R5	SE 32nd St and 139th Ave SE Radii Improvement	Turn Radii	14	8 / 10 / 15	Improve the turn radius for the westbound right turn on 139th Ave SE at SE 32nd St.	7	8	Previously noted in the Bellevue Transit Plan and Bellevue Transit Improvement Analysis.	$$
R9	NE 2nd St and Bellevue Way NE Turn Improvement	Road Upgrade	3, 5, 6	~3 / 3-4 / 5-6	Add a northbound right-turn lane and a second southbound left turn lane.	15–17	15	Previously noted in the Bellevue Transit Plan and Bellevue Transit Improvement Analysis.	$$$
R10	SE 36th St and 142nd Ave SE	Turn Lanes	7	8 / 10 / 15	Improve eastbound to northbound and southbound to westbound turn movement through construction of southbound right turn lane and northbound bus stop pullout.	11–19	13–19	Previously noted in the Eastgate/I-90 Land Use and Transportation Project.	$$$
R11	Northup Way and NE 116th St Turn Improvement	Turn Lanes	5, 14	4 / 5 / ~8	Add an eastbound to southbound right turn lane.	16	24	Addresses future intersection LOS of F with queuing issues, high bus frequency.	$$

Note: These projects are conceptual and the final details of design will be developed as the projects proceed further along in the implementation process.

Table 24 continued.

ID	Project	Type	FTN Service		Project Description	Composite Scores		Project Need	Cost Range
			Routes	Frequency (Peak/Base/Night)		Short-Term	Long-Term		
Intersection and Roadway Improvements (cont.)									
R12	NE 8th St and 156th Ave NE Turn Radii	Turn Radii	6, 7	4 / 5 / ~8	Improve the southbound to westbound turn radius.	21	14	Addresses operator comment.	$$
R13	NE 12th St and 116th Ave NE Turn Lane	Turn Lanes	5, 14	4 / 5 / ~8	Add a westbound to northbound right turn lane.	15	16	Addresses future intersection LOS of E and queuing issues.	$$
R14	NE 10th St and 116th Ave NE Channelization	Channelization	5	8 / 10 / 15	Clarify channelization of the eastbound approach such that right lane feeds into curb right-turn only lane and first left-turn only lane.	18	13	Prioritizes lane with transit at closely spaced intersection.	$
R15	116th Ave SE and Main St Turn Lane	Turn Lanes	13	8 / 10 / 15	Add a second northbound to westbound turn lane. Time of day ITS solutions might eliminate the need for lane construction.	10	13	Addresses existing left turn queuing issues.	$$$
R16	NE 8th St and 120th Ave NE Turn Lane	Turn Lane	6	8 / 10 / 15	Add a second westbound to southbound turn lane and restrict to HOV and transit.	16	16	Addresses existing left turn queuing issues.	$$
R18	NE 4th St and Bellevue Way Turn Improvement	Turn Improvement	3, 5, 6	~3 / 3-4 / 5-6	Add a southbound right turn lane, a westbound right turn lane, and dual westbound left turn lanes.	21	17	Previously noted in the Transportation Facilities Plan. See TIP-48 and TFP-222.	$$$
Signalization Improvements									
Citywide-S1	Traffic Computer System Upgrade	ITS	NA	NA	Citywide replacement of traffic signal and software to upgrade to SCATS traffic system.	N/A	N/A	SCATS implementation has shown to reduce travel times, which will generally result in improved speed and reliability of transit service.	NC
Citywide-S2	Controller Equipment and Software Standards	Standards	NA	NA	Coordinate with King County Metro on equipment and software TSP standards for all new signal controllers.	N/A	N/A	Ensures TSP treatments can be easily implemented in the future with existing equipment and software	NC
S1	NE 4th St and 108th Ave Turn Improvement	Turn Improvement	3, 6	4 / 5-8 / 15-20	Improve the eastbound left turn level-of-service (LOS) for transit through increased time allocation or TSP. Explore strategies to reduce southbound right turn delays caused by pedestrians.	26	18	Addresses top operator comment location.	$
S3	South Kirkland P&R Signalizations	Signalization	4, 5, 14	~3 / 3-4 / 5-6	Signalize 108th Ave NE at the South Kirkland Park-and-Ride entrance.	16	13–14	Previously noted in the Bellevue Transit Plan and Bellevue Transit Improvement Analysis	$$
S4	Coal Creek Pkwy SE and 119th Ave SE Turn Improvement	Turn Improvement	11	8 / 10 / 15	Improve the westbound to southbound and northbound to eastbound turn movements through timing prioritization and TSP.	13–17	19–20	Addresses future intersection LOS of F and queuing issues.	$
S6	SE 37th St and 150th Ave SE Turn Restriction	Turn Restriction	13	8 / 10 / 15	Restrict southbound to eastbound turns during PM peak hours to HOV and transit to reduce volumes and ensure that eastbound SE 37th St is not blocked by queuing traffic from I-90 eastbound.	14	14	Addresses existing and future LOS of E and F.	$
S7	Bellevue Way and NE 10th St Turn Improvement	Turn Improvement	1	4 / 5 / 15	Improve the southbound to eastbound turn movement through signal timing prioritization and TSP. Improve the westbound to northbound movement through conversion of the right through lane to a right-turn only lane.	13	14	Reduces intersection signal delay	$
S8	Bellevue Way and South Bellevue Park and Ride TSP Improvement	TSP Improvement	1, 3, 11	~3 / 3-4 / 5-6	Improve the responsiveness of northbound TSP operations.	19	22	Addresses multiple operator comments that northbound TSP was not responsive enough	$
S9	112th Ave NE and NE Main St Turn Improvement	Turn Improvement	1, 13	4 / 5-8 / 15-20	Improve the northbound to westbound turn movement through timing prioritization and TSP.	14	20	Addresses future intersection LOS of F.	$
S10	NE 8th St and 156th Ave NE Turn Improvement	Turn Improvement	6, 7	4 / 5 / ~8	Improve the eastbound to northbound left turn through timing prioritization and TSP. If improvements are inadequate, consider construction of a second left turn lane.	24	17	Addresses multiple operator comments.	$$$

Note: These projects are conceptual and the final details of design will be developed as the projects proceed further along in the implementation process.

TRANSIT SIGNAL PRIORITY

Draft

Potential transit signal priority (TSP) projects were initially being considered at all signalized intersections through which 2030 Frequent Transit Network (FTN) routes will operate. Following the completion of early feasibility screening, potential transit signal priority (TSP) projects were then divided into three groups. The first group, shown in Table 25 on page 171, includes forty-four near-term projects that will be pursued through 2020. These represent all signalized intersections that are served by existing Route 271 (FTN Routes 1 and 13) and the RapidRide B Line (FTN Routes 6 and 7) that have not been eliminated by early feasibility screening. While TSP has already been deployed on some intersections served by the B Line, near-term projects along NE 8th St, 156th Ave NE, and 148th Ave NE would complete implementation associated with that route.

A cost estimate is not provided for near-term TSP projects in Table 25 because the cost of implementation at each intersection is estimated to be $15,000. TSP costs for each intersection were estimated based on approximate costs provided by King County Metro. These estimates do not include capital or operational costs of communication, nor do they include signal controller, cabinet, or foundation upgrades. More detailed analysis of the communication, cabinet, controller, and signal upgrades necessary for TSP implementation is required for more detailed cost estimates to be developed.

The second group of projects (see Appendix Table 27 on page A300) are those that have been eliminated from further consideration following 'fatal flaw' early feasibility screening. Twelve intersections for which potential signal projects were identified have been eliminated based on known signal and/or roadway limitations, and two additional intersections were removed by project consultants. Generally, the intersections with 'fatal flaws' identified are those that

Figure 152 Potential transit signal priority (TSP) projects.

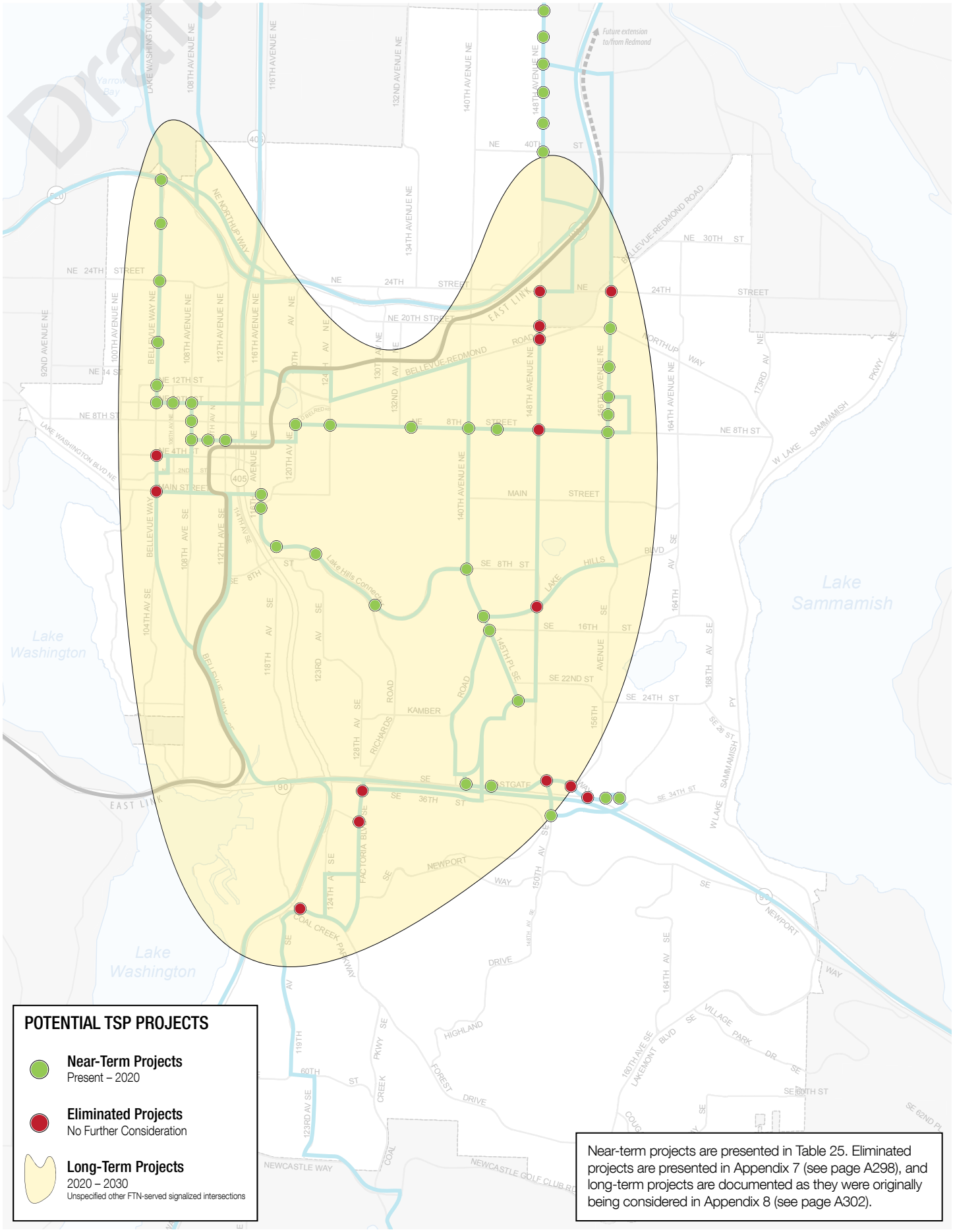


Table 25 Potential near-term transit signal priority (TSP) projects.

Intersection ID	Cross Streets	Direction(s)	Approach Composite Scores		FTN Route(s)	Previous TSP Priority	Related TMP Project	Related TFP Project
			Short-Term	Long-Term				
5	Bellevue Way NE & NE 12th Ave	Northbound, Southbound	7–13	13–14	1			
6	Bellevue Way NE & NE 10th Ave	Southbound, Westbound	9–13	14–17	1		X	
21	NE 8th St & 108th Ave NE	Northbound, Southbound	27	23	1, 5		X	X
33	NE 8th St & 120th Ave NE	Northbound, Westbound	16–17	14–16	6		X	X
35	NE 8th St & 124th Ave NE	Eastbound, Westbound	10–16	12–16	6	X		
41	NE 8th St & 140th Ave NE	Eastbound, Westbound, Northbound, Southbound	9–17	16–18	6, 14		X	
43	Lake Hills Connector & 140th Ave SE	Eastbound, Northbound, Southbound	11–16	11–16	13, 14			X
43	Lake Hills Connector & SE 8th St	Northbound, Southbound	12–16	12–16	13, 14			X
44	Lake Hills Blvd & 145th Pl SE	Eastbound, Northbound, Southbound	11–16	11–16	7, 13, 14			X
45	Kamber Rd & 145th Pl SE	Northeastbound, Northwestbound, Southeastbound	3–17	10–18	7, 13, 14			X
46	NE 8th St & 143rd Ave NE	Eastbound, Westbound	17–19	15–17	6	X		
54	SE 24th St & 145th Pl SE	Eastbound, Southbound	17–19	12–18	7, 12, 13			
62	156th Ave NE & Northup Way	Northbound, Southbound	21–27	14–17	7		X	
63	NE 8th St & 156th Ave NE	Eastbound, Westbound, Northbound, Southbound	15–24	9–17	6, 12		X	
66	156th Ave NE & NE 15th St	Northbound, Southbound	12–14	8–9	6, 7			
67	156th Ave NE & NE 10th St	Northbound, Southbound	17–21	9–14	7			
69	Bellevue Way NE & NE 24th Ave	Northbound, Southbound	7–9	11–12	1			
70	156th Ave NE & NE 13th Way	Northbound, Southbound	12–14	8–9	7			
73	Main St & 116th Ave	Eastbound, Northbound	5–10	13–18	13		X	
79	148th Ave NE & NE 40th St	Northbound, Southbound	13–23	18–21	12		X	
91	SE Eastgate Way & 160th Ave SE	Westbound	10	9	13			
92	SE Eastgate Way & 161st Ave SE	Westbound	6	7	13			
107	NE 6th St & 112th Ave NE	Eastbound, Westbound	24–28	23	2, 6		X	
124	NE 6th St & 110th Ave NE	Eastbound, Westbound	27–32	20–21	2, 6		X	
126	NE 6th St & 108th Ave NE	Northbound, Southbound, Westbound	26–32	18–23	1, 2, 5, 6		X	X
131	116th Ave SE & SE 1st St	Northbound, Southbound	10–12	11–13	13			
134	Lake Hills Connector & Richards Rd	Eastbound, Westbound	12–14	14–16	13		X	
136	Bellevue Way NE & 2900 Block Crosswalk	Northbound, Southbound	7	12–15	1			
137	Bellevue Way NE & 1700 Block Crosswalk	Northbound, Southbound	7–9	11–13	1			
154	NE 10th St & 106th Ave NE	Eastbound, Westbound	9	17–19	1		X	
190	NE 10th St & 108th Ave NE	Eastbound, Northbound, Westbound	9–27	19–23	1, 5		X	X
213	Bellevue Way NE & SR-520 SPUI	Northbound, Eastbound	7	15	1		X	
227	150th Ave SE & SE 37th St	Southbound	14	14	13		X	
249	148th Ave NE & NE 51st St	Northbound, Southbound, Westbound	19–21	21	7, 12		X	
272	SE Eastgate Way & 139th Ave SE	Eastbound, Westbound, Southbound	7–26	12–14	13, 14	X		
287	148th Ave NE & NE 60th St	Northbound, Southbound	9	14	7, 12			
288	NE 8th St & 13300 Block Crosswalk	Eastbound, Westbound	10–15	12–18	6			
299	NE 8th St & 158th Ave NE	Eastbound, Westbound	5–15	5–14	6			
319	SE Eastgate Way & 140th Ave SE	Eastbound, Southbound, Westbound	17	12–15	7, 13, 14	X		
NA_1	Lake Hills Connector & I-405 NB off-ramp	Eastbound, Westbound	12–16	11–16	13			
NA_2	SE Eastgate Way & Eastgate P&R Entrance	Westbound, Eastbound	19–26	13–14	13			
NA_3	148th Ave NE & NE 4200 Block	Northbound, Southbound	13–23	18–21	12		X	
NA_3	148th Ave NE & NE 5600 Block	Northbound, Southbound	9–19	14–21	7, 12			
NA_4	148th Ave NE & NE 46th St	Northbound, Southbound	21–23	21	12		X	

Note: These projects are conceptual and the final details of design will be developed as the projects proceed further along in the implementation process.

have such significant congestion—often in all travel directions—that the use of signal pre-emption for transit would seriously interfere with signal phasing and cause unacceptable delays to cross traffic. For example, the intersections of 148th Ave NE/NE 20th St and Factoria Blvd/SE 36th St both experience substantial congestion due to nearby freeway interchanges, making TSP implementation untenable there.

The final group of potential TSP projects are those that may be pursued between 2020–2030. This group includes an unspecified number of the remaining signalized intersections served by 2030 FTN routes, indicated in Figure 152 by a yellow area covering much of the city (see Appendix D9 on page A302). If transit efficiency and reliability were the only two considerations necessary in determining where TSP should be deployed—that is, if cost were no object, impacts to other travel modes were deemed insignificant, and no technical limitations existed on where TSP could be deployed—then TSP might reasonably be pursued at all or most of these signals. However, this is of course not the case, as all of these other factors are also critical considerations in determining where transit priority can and should be implemented. Therefore, the specific projects that may be included in this group will not be identified until after 2020, after Metro has identified its anticipated capacity to expand its TSP capabilities.

Unfold for full sheet

TRACKING & FURTHER STUDY

In addition to the physical infrastructure improvement projects proposed, five projects dealing with performance tracking and further study have also been identified (Table 26). Though less visible than the 'brick-and-mortar' running way and spot improvement projects, and less immediately impactful to transit operations than transit signal priority projects, these tracking and study projects would provide valuable opportunities for the City to ensure that its investments in transit priority are functioning as intended and providing the greatest return on investment possible.

The tracking and study projects include two targeted projects and three city-wide projects. Project L12 would track the volumes of traffic between Bellevue Transit Center and the NE 6th St direct-access ramp to I-405 to ensure that speed and reliability do not decline over time, and Project R17 would study how speed and reliability could be improved for westbound buses from SR-520 to the South Kirkland Park-and-Ride. Citywide-R1 would track the adequacy of turn pocket lengths along FTN corridors and adjust signal timing as needed. Citywide-S3 and Citywide-S4 both deal with TSP performance. The former would develop TSP performance standards and track the resulting measures to ensure that TSP systems are functional and optimized, while the latter project would conduct a before-and-after study of the benefits provided to transit by TSP at selected intersections, as well as its impacts on general purpose traffic. None of these projects have associated capital costs, and Project R17 is the lone project whose cost was identified as 'N/A' (see Table 20 on page 148).

Table 26 Tracking projects and studies.

ID	Project	Type	FTN Service		Composite Scores		Project Description	Project Need
			Routes	Frequency (Peak/Base/Night)	Short-Term	Long-Term		
L12	NE 6th St Bus Priority Corridor	Tracking	1, 2, 3, 5, 6, 11, 13	~1 / 1-2 / ~2	24–28	23	Highlight transit priority over general purpose and HOV traffic on NE 6th St from BTC to I-405 direct access ramps. Track general purpose and HOV volumes to ensure they do not result in degradation of speed and reliably below existing levels, and take steps to mitigate growing HOV volumes if needed.	Addresses very high bus volumes between BTC and I-405.
Citywide-R1	Transit Turn Priority	Tracking	NA	NA	N/A	N/A	Monitor right and left turn pockets used by Frequent Transit Network (FTN) routes for level-of-service and adequacy of pocket length. Use signal timing work to prioritize these movements to ensure fast and reliable transit service.	Turning moments at major intersections with long signal cycles can have a significant impact on the speed and reliability of routes.
R17	SR-520 and 108th Ave NE Exit Transit Priority	Study	4	8 / 10-15 / 30	30	23	Improve the speed and reliability of SR-520 westbound buses to South Kirkland Park-and-Ride through signal operations, striping, or construction of bus facilities.	Addresses 2010 and 2030 intersection LOS of E and F.
Citywide-S3	TSP Performance Tracking and Optimization	Tracking	NA	NA	N/A	N/A	Develop TSP performance standards in coordination with King County Metro. Track performance and ensure that TSP is operational and optimized.	Develop shared goals of successful TSP implementation between the City of Bellevue and King County Metro.
Citywide-S4	TSP Before and After Study	Study	NA	NA	N/A	N/A	Complete a before and after study at select intersections to assess the benefits of TSP to transit and the impacts on general purpose traffic. Use person throughput and person delay as performance measures.	Provides a local example of the benefits and impacts on TSP implementation for staff and policy makers.

Draft

Draft

This page intentionally left blank.

PROJECTED OUTCOMES

Draft

This section summarizes the results of initial efforts to model the impacts of implementing some of the potential projects considered in this report. The results presented here were generated using Dynameq, a dynamic traffic simulaton application that is capable of assessing traffic patterns under congested conditions. This software models vehicles of multiple modes and captures lane-based effects and explicit signal timing, making it a useful tool for considering how HOV and BAT lane projects would affect transit and automobile travel time along Frequent Transit Network (FTN) corridors. Other project types like queue jumps and TSP cannot be modeled with this application and are therefore not considered in this analysis. It should be noted that at this level of study, the modeling is done on the set of proposed HOV and BAT lane projects as a group (identified as the HOV/BAT Lane scenario; see Table 23 on page 159 for details about all of the projects included). As implementation of the Transit Master Plan progresses, more detailed modeling will be done to assess the benefits of individual projects.

This Dynameq-based assessment suggests that implementation of every HOV and BAT lane project being proposed will improve the average transit travel speed for each category of FTN service by roughly 1 mph (see Table 27). Although this may sound like a small improvement, this level of speed increase represents approximately half of the total improvement needed for Frequent Local (FL) routes to achieve the operating speeds assumed in the *Transit Service Vision Report*. Frequent Rapid (FR) routes achieve about one-third of the improvement in average speed required, and Frequent Express (FX) routes about one-quarter.

Table 27 Average transit and general purpose travel speeds by FTN service category before and after HOV and BAT lane implementation.

Scenario	Avg. Speed Along FTN Corridors by Service Type (mph)		
	FX	FR	FL
Transit			
Baseline	18	12	12
HOV/BAT Lane Projects	19	13	13
2030 Targets	22	15	14
General Purpose Traffic			
Baseline	20	13	13
HOV/BAT Lane Projects	21	14	14

Source: Dynameq model D30R1.0.3, for November 14, 2013 Transportation Commission meeting.

Table 28 Transit and general purpose travel time by FTN route before and after HOV and BAT lane implementation.

FTN Route	FTN Type	From / To	Dir.	Dist. (miles)	Baseline		HOV/BAT Lane Projects	
					Avg. Travel Time (min)	Avg. Speed (mph)	Avg. Travel Time (min)	Avg. Speed (mph)
Transit								
1	FX	Lakemond Interchange to NE 84th St	In	11.41	37.1	18.4	34.9	19.6
			Out	11.15	46.8	14.3	44.1	15.2
2	FX	NE 124th St Interchange to NE 102nd Ave	In	8.03	22.8	21.1	21.1	22.8
			Out	7.64	40.4	11.3	40.7	11.3
3	FX	Kennydale to Bellevue Transit Center	In	8.34	18.6	25.9	18.4	27.2
			Out	8.34	34.0	13.8	30.2	16.6
4	FX	Union Hill/SR520 to NE 84th Ave	In	10.05	24.2	24.9	20.8	28.9
			Out	8.91	20.5	26.1	21.4	25.0
5	FR	NE 124th St Interchange to Bellevue Transit Center	In	9.17	34.8	15.8	37.9	14.5
			Out	9.42	53.4	10.6	53.5	10.6
6	FR	Crossroads to Bellevue Way/NE 4th	In	3.62	23.3	9.3	22.5	9.6
			Out	3.55	20.8	10.2	19.5	10.7
7	FR	Town Square to Factoria Mall	In	12.55	57.3	13.1	55.8	13.5
			Out	11.97	54.5	13.2	48.8	14.6
11	FL	Newcastle Way to Bellevue Transit Center	In	7.94	34.4	13.9	35.6	13.5
			Out	7.99	47.0	10.2	41.8	11.3
12	FL	148th/Old Redmond Rd to Eastgate Park-and-Ride	In	7.20	32.3	13.4	32.5	13.3
			Out	7.20	40.0	10.8	33.0	13.1
13	FL	Bellevue Transit Center to Eastgate Park-and-Ride	In	7.89	39.4	12.0	38.3	12.4
			Out	7.95	36.3	13.1	31.5	15.1
14	FL	Eastgate Park-and-Ride to Lake Wash Blvd	In	7.91	37.2	12.7	32.9	14.4
			Out	7.88	39.6	11.9	38.4	12.3
General Purpose Traffic								
1	FX	Lakemond Interchange to NE 84th St	In	11.41	35.2	19.4	31.4	21.8
			Out	11.15	42.6	15.7	41.8	16.0
2	FX	NE 124th St Interchange to NE 102nd Ave	In	8.03	22.2	21.7	18.3	26.3
			Out	7.64	35.5	12.9	37.8	12.1
3	FX	Kennydale to Bellevue Transit Center	In	8.34	17.7	28.2	17.9	27.9
			Out	8.34	31.7	16.0	23.6	21.5
4	FX	Union Hill/SR520 to NE 84th Ave	In	10.05	22.0	27.4	20.2	29.8
			Out	8.91	18.1	29.5	18.1	29.5
5	FR	NE 124th St Interchange to Bellevue Transit Center	In	9.17	30.4	18.1	34.6	15.9
			Out	9.42	47.2	12.0	51.5	11.0
6	FR	Crossroads to Bellevue Way/NE 4th	In	3.62	21.5	10.1	17.4	12.5
			Out	3.55	20.5	10.4	21.1	10.1
7	FR	Town Square to Factoria Mall	In	12.55	51.5	14.6	51.2	14.7
			Out	11.97	53.1	13.5	46.4	15.5
11	FL	Newcastle Way to Bellevue Transit Center	In	7.94	28.6	16.6	30.2	15.8
			Out	7.99	42.2	11.4	39.7	12.1
12	FL	148th/Old Redmond Rd to Eastgate Park-and-Ride	In	7.20	28.8	15.0	29.4	14.7
			Out	7.20	40.4	10.7	31.6	13.7
13	FL	Bellevue Transit Center to Eastgate Park-and-Ride	In	7.89	39.5	12.0	39.7	11.9
			Out	7.95	37.7	12.7	33.4	14.3
14	FL	Eastgate Park-and-Ride to Lake Wash Blvd	In	7.91	29.4	16.2	30.0	15.8
			Out	7.88	33.5	14.1	32.0	14.8

Source: Dynameq model D30R1.0.3, for November 14, 2013 Transportation Commission meeting.
Notes: The above figures reflect only the length of each route operating either wholly within Bellevue or to the nearest bus stop outside of Bellevue city limits. For example, Route 3 terminates at Kennydale Park-and-Ride for the purposes of this modeling exercise. This is done to minimize the extent to which route segments outside of Bellevue's jurisdiction, which do not benefit from the HOV and BAT lane projects being considered in Bellevue, affect the average speeds and travel times realized as a result of these potential improvements.

Draft

That Frequent Express routes would realize less substantial improvements than Frequent Local routes stands to reason given the nature of these routes and the projects reflected in this analyis. Frequent Express routes operate long segments on highways, while all of the HOV and BAT lane projects assessed here are on local streets over which Bellevue has jurisdiction. To achieve additional improvement to Frequent Express travel times, some transit accommodations may be necessary on SR-520, I-90, and I-405, such as increasing HOV lane use requirements from 2+ to 3+ passengers, for example. By contrast, Frequent Local routes operate entirely on local arterial streets, so these running way projects are able to more directly target the range of issues affecting them.

Table 28 indicates that most routes would realize travel time improvements of two minutes or more in one or both travel directions, including Route 1FX, Route 3FX outbound, Route 4FX inbound, Route 5FR inbound, Route 7FR outbound, Route 11FL outbound, Route 12FL outbound, Route 13FL outbound, and Route 14FL inbound. Note that many potential HOV and BAT lane projects apply only to one direction of travel, hence the benefits are not realized equally by inbound and outbound trips. Outbound trips of Routes 7FR, 11FL, and 12FL would realize the largest improvements—roughly six minutes for each—which may suggest that Projects L1-L3, L6, L23, L24, and L26 are particularly effective in addressing the speed and reliability issues affecting transit on these corridors. However, because all projects are modeled simultaneously, as noted above, it is not clear from this analysis which of these projects has the greatest impact.

Table 29 reflects the systemwide impacts of implementing every potential HOV and BAT lane project currently being considered. Although the number of signalized intersections with a peak-hour LOS of 'B' decreases and those rated 'C' increase, intersections with an LOS of 'D', 'E', and 'F' all decline, resulting in an overall improvement in citywide peak vehicle delay of 2 seconds.

Draft

Draft

Stated simply, time is money. In this case, this addage applies both to the value of transit users' time spent riding the bus and to the cost for transit providers to operate the service. For riders, time spent traveling could be better used to achieve more productive ends. For transit operators, minutes lost to traffic congestion can mean the difference between requiring three buses or four to operate the same route at a given frequency. The improvements in speed and travel time realized by implementing HOV and BAT lane projects can therefore be monetized to estimate the aggregate value of the time saved. As shown in Table 30, these improvements in travel time translate to societal savings of between $2.5–$4.2 million annually during the PM peak alone, depending on the rate at which riders' time spent traveling is valued relative to the region's mean hourly wage. Additional savings would also be realized during other times of day, particularly in the AM peak, but because travel demand model outputs reflect PM peak conditions, no assumptions are made here about the savings realized during other periods.

For transit operators, the calculation is somewhat more complicated for two reasons. First, the ability to remove a bus from a schedule while maintaining the same headways depends on multiple factors that

Table 29 2030 PM peak hour signalized intersection LOS before and after HOV and BAT lane implementation.

		2030 Reduced Funding w/o HOV/BAT Projects	2030 Growing Resources w/o HOV/BAT Projects	2030 Growing Resources with HOV/BAT Projects
Level of Service (LOS)	A	8	8	8
	B	27	31	28
	C	49	49	54
	D	50	53	52
	E	33	30	33
	F	28	24	20
Citywide LOS		D	D	D
Citywide Avgerage Vehicle Delay (sec)		51.8	49.9	48.3
Citywide Total Delay Hours		8,141	7,665	7,350

Source: Dynameq model D30R1.0.3, for November 14, 2013 Transportation Commission meeting.

are not reflected by this analysis. Second, the travel demand models used here to assess transit travel speed assume the service frequencies defined by the 2030 Growing Resources scenario as model inputs. However, it will only be possible to operate these frequencies within the budget defined by the *Funding Scenarios Report* if transit travel speeds meet or exceed the speeds assumed for each service type in the *Service Vision Report*. Nevertheless, it is still instructive to estimate the operating cost savings attributable to implementing these HOV and BAT lane projects, even if these savings are reinvested in prodiving service at the frequencies being proposed. To that end, Table 31 indicates that transit service providers would save between about $510,000–$780,000 annually based on the travel time savings achieved in the PM peak period alone, depending on the assumed operating cost per hour. See Appendix D11 on page A307 for additional information about how these figures for the value of travel time savings were calculated.

Given that only a portion of the proposed transit priority projects can be modeled (i.e. HOV and BAT lanes), it can be expected that implementation of the entire package of improvements would result in greater travel time savings than are reflected here. This is because HOV and BAT lanes are often paired with other improvements, such as queue jump lanes and/or TSP to help transit pass through problematic intersections more efficiently. This assessment therefore only presents part of the picture—the degree of benefit achieved by HOV and BAT lanes in isolation of any other related transit priority projects—so the results presented in Table 27 should not be understood to mean that the City will be unable to achieve the target travel speeds assumed in the *Transit Service Vision Report*. The other types of priority projects being considered will also contribute to transit travel speed improvement, but those projects' benefits will need to be assessed using more detailed applications.

Draft

Table 30 Value of Annualized PM Peak Travel Time Savings for Transit Users from Proposed HOV/BAT Projects.

FTN Service Type	Annualized PM Peak Pass Hours Saved	Value of Pass Hours Saved		
		Low	Medium	High
FX	148,592	$1,439,564	$2,056,519	$2,344,432
FR	17,414	$168,711	$241,016	$274,759
FL	99,779	$966,655	$1,380,936	$1,574,267
Annual Total:		**$2,574,930**	**$3,678,471**	**$4,193,457**

Notes: Value of travel time savings based on the May 2012 mean hourly wage for Seattle-Everett-Bellevue of $27.68, obtained from the US Department of Labor Bureau of Labor Statistics. Low, Medium, and High estimates are based on the percentage of that wage considered when valuing transit passenger time, reflecting 35%, 50%, and 57%, respectively. Higher rates of time valuation relative to the mean hourly wage correspond to reduced perceived convenience due to lower intersection LOS (e.g. High corresponds to LOS 'D') and/or standing rather than sitting. See Appendix 9 on page A307 for details.

Table 31 Value of Annualized PM Peak Travel Time Savings to Transit Operators from Proposed HOV/BAT Projects.

FTN Service Type	Annualized PM Peak Revenue Hours Saved	Value of Revenue Hours Saved	
		Low[1]	High[2]
FX	2,352	$209,285	$319,054
FR	521	$46,399	$70,736
FL	2,869	$255,322	$389,238
Annual Total:		**$511,007**	**$779,027**

1. Low estimate based on King County Metro's 2010 marginal hourly operating cost of $89.
2. High estimate based on King County Metro's 2012 'Transit Operating Cost per Vehicle Hour', as reported on the agency's website at: http://metro.kingcounty.gov/am/reports/annual-measures/financial.html#cost-per-hour. See Appendix 9 on page A307 for details.

Draft

This page intentionally left blank.

Draft

SECTION 5:
APPENDICES

Draft

This page intentionally left blank.

Draft

APPENDIX A: COMPREHENSIVE PLAN POLICIES RELATED TO TRANSIT

The Development Lot

The following are current transit-supportive Bellevue Policies that address the importance of the development lot:

TR-8: Incorporate transit-supportive and pedestrian-friendly design features in new development through the development review process.

2. Avoid constructing large surface parking areas between the building frontage and the street.
4. Cluster major buildings within developments to improve pedestrian and transit access.

LU-24: Encourage adequate pedestrian connections with nearby neighborhood and transit facilities in all residential site development.

UD-48: Encourage site and building designs that support and connect with existing or planned transit facilities in the vicinity.

TR-61: Work with transit providers to maintain and expand direct and frequent regional bus routes to support the city's land use and mode split goals.

TR-70: Promote transit use and achieve land use objectives through transit system planning that includes consideration of:

1. Land uses that support transit, including mixed use and night-time activities…

TR-9: Coordinate with other Eastside jurisdictions, the private sector, and the transit providers to develop and implement uniform or compatible transportation demand management regulations and strategies that are consistent with and implement the state Commute Trip Reduction Act and address the following factors:

1. Parking...

Draft

The Pedestrian and Bicycle Environment

The following are current transit-supportive Bellevue Policies that address the importance of the pedestrian and bicycle environment:

TR-8: Incorporate transit-supportive and pedestrian-friendly design features in new development through the development review process. Examples include:...

7. Provide bicycle connections and secure bicycle parking and storage convenient to major transit facilities;

TR-24: Incorporate pedestrian and bicycle facility improvements into roadway projects and incorporate transit/high-occupancy vehicle improvements where feasible.

TR-75.28: Encourage transit-to-transit, transit-to-pedestrian, transit-to-bicycle, and transit-to-pick-up/drop-off transfers, with an emphasis on safety for people transferring between the station platform and the various modes.

TR-54: Work with transit providers to create, maintain, and enhance a system of supportive facilities and systems such as...

5. Pedestrian and bicycle facilities, including secure bicycle parking.

TR-56: Develop partnerships with transit providers to implement projects providing neighborhood–to–transit links that improve pedestrian and bicycle access to transit services and facilities.

TR-70: Promote transit use and achieve land use objectives through transit system planning that includes consideration of:...

4. Integrating multiple access modes, including buses, carpools and vanpools, bicycles and pedestrians...

TR-79: Assign high priority to pedestrian and bicycle projects that:...

3. Provide accessible linkages to the transit and school bus systems

TR-80: Encourage transit use by improving pedestrian and bicycle linkages to the existing and future transit and school bus systems, and by improving the security and utility of park-and-ride lots and bus stops.

LU-24: Encourage adequate pedestrian connections with nearby neighborhood and transit facilities in all residential site development.

UD-49: Design and coordinate the proximity of bike racks, wheelchair access, pedestrian amenities, and other modes of transportation with transit facilities.

The Transit Stop

The following are current transit-supportive Bellevue Policies that address the importance of the transit stop:

TR-8: Incorporate transit-supportive and pedestrian-friendly design features in new development through the development review process…5. Provide weather protection such as covered walkways or arcades connecting buildings in major developments, and covered waiting areas for transit and ridesharing...

TR-14: Require new development to incorporate physical features designed to promote use of alternatives to single-occupant vehicles, such as...3. Transit facilities, including comfortable bus stops and waiting areas, adequate turning room, and where appropriate, signal preemption and queue-jump lanes.

TR-54: Work with transit providers to create, maintain, and enhance a system of supportive facilities and systems such as…

1. Transit stations and centers;
2. Passenger shelters;
3. Park and ride lots.

The Transit Running Way

The following are current transit-supportive Bellevue Policies that address the importance of "The Transit Running Way":

TR-54: Work with transit providers to create, maintain, and enhance a system of supportive facilities and systems such as:…

4. Dedicated bus lanes, bus layovers, bus queue by-pass lanes, bus signal priorities.

TR-61: Work with transit providers to maintain and expand direct and frequent regional bus routes to support the city's land use and mode split goals.

Draft

Draft

This page intentionally left blank.

APPENDIX B

APPENDIX B1: TRANSIT PRIORITY PEDESTRIAN AND BICYCLE PROJECT LISTS

Draft

Consistent with the maps presented on The following pages itemize all transit priority pedestrian and bicycle projects in four parts:

1. Sidewalk projects
2. Bicycle projects
3. Offstreet Path projects
4. Trail projects

All projects reflected in these tables are derived from the 2009 Pedestrian and Bicycle Transportation Plan Report except for projects P-1, P-2, S-1, I-1, I-2, I-3, and I-4, which all come from the Eastgate/I-90 Transportation Strategies Report. Additionally, the descriptions and extents of two projects derived from the 2009 Ped-Bike Plan have been revised in these tables: sidewalk project S-464 and bicycle project B-146. These projects have been updated to reflect the details of Running Way Project L27—the 142nd Pl SE/Snoqualmie River Rd Multimodal Transportation Corridor—proposed in this report. Thus, revised project S-464 recommends constructing a sidewalk on the west side of 142nd Pl SE from SE 36th St to SE 32nd St, on the east and south sides of the re-aligned Snoqualmie River Rd from SE 32nd St to SE 24th St. And whereas project B-146 previously recommended the installation of a bicycle lane on both the east and west sides of 142nd Pl SE from SE 36th St to SE 28th St, the revised project recommends constructing an off-street bicycle facility only on the east side from SE 36th St to SE 32nd St and on the west side of Snoqualmie River Rd from SE 32nd St to SE 24th St.

Appendix Table 1 Transit priority sidewalk projects.

Type	Project #	Link	Limits	Description	Priority
Sidewalk	S-1	Factoria Blvd	SE Eastgate Way to SE 38th St	Enhance sidewalk, pedestrian crossing, and intersection improvements along Factoria Boulevard consistent with the 2005 Factoria Transportation Study.	N/A
Sidewalk	S-101-N	NE 8th St	116th Ave NE to 120th Ave NE	Add a 12 foot wide sidewalk and a 4 foot wide planter strip on the north side of NE 8th Street from 116th Avenue NE to 120th Avenue NE where not complete.	High
Sidewalk	S-101-S	NE 8th St	116th Ave NE to 120th Ave NE	Add a 12 foot wide sidewalk and a 4 foot wide planter strip on the south side of NE 8th Street from 116th Avenue NE to 120th Avenue NE where not complete.	High
Sidewalk	S-102-E	100th Ave SE/SE Bellevue Pl	Meydenbauer Way SE to Main St	Add a 12 foot wide sidewalk and 4 foot wide planter strip on the east side of 100th Avenue SE and SE Bellevue Place from Meydenbauer Way SE to Main Street.	High
Sidewalk	S-200-E	124th Ave NE	Northup Way to Bel-Red Rd	Add an 8 foot wide sidewalk and a 4 foot side planter strip on the east side of 124th Avenue NE from Northup Way to Bel-Red Road where not complete.	High
Sidewalk	S-200-W	124th Ave NE	Northup Way to Bel-Red Rd	Add an 8 foot wide sidewalk and a 4 foot side planter strip on the west side of 124th Avenue NE from Northup Way to Bel-Red Road where not complete.	High
Sidewalk	S-204-S	NE 11th St	111th Ave NE to 112th Ave NE	Add an 8 foot wide sidewalk and a 4 foot wide planter strip along the south side of NE 11th Street from 111th Avenue NE to 112th Avenue NE.	High
Sidewalk	S-205-W	105th Ave NE	NE 4th St to NE 2nd St	Add an 8 foot wide sidewalk and a 4 foot wide planter strip along the west side of 105th Avenue NE from NE 4th Street to NE 2nd Street.	High
Sidewalk	S-207-E	111th Ave NE	NE 4th St to NE 2nd St	Add an 8 foot wide sidewalk and a 4 foot wide planter strip on the east side of 111th Avenue NE from NE 4th Street to NE 2nd Street.	High
Sidewalk	S-207-W	111th Ave NE	NE 4th St to NE 2nd St	Add an 8 foot wide sidewalk and a 4 foot wide planter strip on the west side of 111th Avenue NE from NE 4th Street to NE 2nd Street.	High
Sidewalk	S-209-S	NE 1st St (Old Bellevue Sidewalks)	103rd Ave NE to Bellevue Way	Add an 8 foot wide sidewalk and a 4 foot wide planter strip along the south side of NE 1st Street from 103rd Avenue NE to Bellevue Way.	High
Sidewalk	S-210-W	107th Ave NE	NE 2nd St to Main St	Add an 8 foot wide sidewalk and a 4 foot wide planter strip on the west side of 107th Avenue NE from NE 2nd Street to Main Street where not complete.	High
Sidewalk	S-211-W	110th Ave NE	NE 2nd St to Main St	Add an 8 foot wide sidewalk and a 4 foot wide planter strip along the west side of 110th Avenue NE from NE 2nd Street to Main Street where not complete.	High
Sidewalk	S-212-S	NE 2nd St	Bellevue Way to 106th Ave NE	Add an 8 foot wide sidewalk and a 4 foot wide planter strip along the south side of NE 2nd Street from Bellevue Way to 106th Avenue NE.	High
Sidewalk	S-213-N	Main St	Bellevue Way to 116th Ave NE	Add an 8 foot wide sidewalk and a 4 foot wide planter strip along the north side of Main Street from Bellevue Way to 116th Avenue NE.	High
Sidewalk	S-214-E	120th Ave NE	Bel-Red Road to Northup Way	Add an 8 foot wide sidewalk and a 4 foot wide planter strip on the east side of 120th Avenue NE from NE Bel-Red Road to Northup Way where not compete.	High
Sidewalk	S-214-W	120th Ave NE	Bel-Red Road to Northup Way	Add an 8 foot wide sidewalk and a 4 foot wide planter strip on the west side of 120th Avenue NE from Bel-Red Road to Northup Way where not compete.	High
Sidewalk	S-215-E	102nd Ave NE	NE 10th St to NE 8th St	Add an 8 foot wide sidewalk and a 4 foot wide planter strip along the east side of 102nd Avenue NE from NE 10th Street to NE 8th Street where not complete.	High
Sidewalk	S-217-E	150th Ave SE	SE 38th St to SE 43rd St	Add an 8 foot wide sidewalk and a 4 foot wide planter strip on the east side of 150th Avenue SE from SE 38th Street to SE 43rd Street where not complete.	High
Sidewalk	S-217-W	150th Ave SE	SE 37th St to SE 43rd St	Add an 8 foot wide sidewalk and a 4 foot wide planter strip on the west of 150th Avenue SE from SE 37th Street to SE 43rd Street where not complete.	High
Sidewalk	S-301-N	Northup Way	NE 33rd Pl to 124th Ave NE	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the north side of Northup Way from NE 33rd Place to 124th Avenue NE where not complete.	High
Sidewalk	S-301-S	Northup Way	Bellevue Way to 124th Ave NE	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the south side of Northup Way from Bellevue Way NE to 124th Avenue NE where not complete.	High
Sidewalk	S-303-W	112th Ave NE	108th Ave NE to 400' S of NE 24th St	Add a 6 foot wide sidewalk and a 4 foot-wide planter strip along the west side of 112th Avenue NE from 108th Avenue NE to 400 feet south of NE 24th Street.	High
Sidewalk	S-305-N	NE 40th St	140th Ave NE to 142nd Pl NE	Add a curb, gutter, and separated pathway or sidewalk where physical constraints exist, on the north side of NE 40th Street from 140th Avenue NE to 142nd Place NE. (shared lanes and planter strip where feasible)	High
Sidewalk	S-308-N	NE 24th St	105th Ave NE to 108th Ave NE	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the north side of NE 24th Street from 105th Avenue NE to 108th Avenue NE.	High
Sidewalk	S-308-S	NE 24th St	Bellevue Way NE to 108th Ave NE	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the south side of NE 24th Street from Bellevue Way NE to 108th Avenue NE.	High
Sidewalk	S-310-E	132nd Ave NE	NE 16th St to NE 8th St	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the east side of 132nd Avenue NE from NE 16th Street to NE 8th Street where not complete.	High
Sidewalk	S-310-W	132nd Ave NE	Bel-Red Rd to NE 8th St	Add an 6 foot wide sidewalk and a 4 foot wide planter strip on the west side of 132nd Avenue NE from Bel-Red Road to NE 8th Street where not complete.	High
Sidewalk	S-311-N	Northup Way	161st Ave NE to NE 8th St	Add a 6 foot-wide sidewalk and a 4 foot-wide planter strip on the north side of Northup Way from 161st Avenue NE to NE 8th Street where not complete.	High
Sidewalk	S-311-S	Northup Way	156th Ave NE to NE 170th Ave NE	Add a 6 foot-wide sidewalk and a 4 foot-wide planter strip on the south side of Northup Way from 156th Avenue NE to 170th Avenue NE where not complete.	High
Sidewalk	S-313-E	100th Ave NE	NE 14th St to NE 24th St	Add a 6 foot-wide sidewalk and a 4 foot-wide planter strip on the east side of 100th Avenue SE from NE 14th Street to NE 24th Street.	High
Sidewalk	S-314-E	108th Ave NE	NE 24th St to NE 14th St	Add a 6 foot wide sidewalk and a 4 foot wide planter strip along the east side of 108th Avenue NE from NE 24th Street to NE 14th Street where not complete.	High
Sidewalk	S-314-W	108th Ave NE	NE 24th St to NE 12th St	Add a 6 foot wide sidewalk and a 4 foot wide planter strip along the west side of 108th Avenue NE from NE 24th Street to NE 12th Street where not complete.	High
Sidewalk	S-316-E	160th Ave NE	Crossroads Park to NE 8th St	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the east side of 160th Avenue NE from Crossroads Park and Community Center to NE 8th Street.	High
Sidewalk	S-316-W	161st Ave NE	NE 8th to Crossroads Park	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the west side of 160th Avenue NE from Crossroads Park and Community Center to NE 8th Street.	High
Sidewalk	S-319-W	128th Ave NE/SE	NE 7th St to SE 7th Pl	Add a 6 foot wide sidewalk along the west side of 128th Avenue NE/SE from NE 7th Street to SE 7th Place, except in front of Wilburton Park.	High
Sidewalk	S-321-S	NE 6th St	148th Ave NE to 164th Ave NE	Add a 6 foot wide sidewalk and a 4 foot wide planter strip along the south side of NE 6th Street from 148th Avenue NE to 164th Avenue NE where not complete.	High
Sidewalk	S-326-N	Main St	118th Ave SE to 124th Ave NE	Add a 6 foot wide sidewalk and a 4 foot planter strip on the north side of Main Street from 118th Avenue SE to 124th Avenue NE.	High
Sidewalk	S-327-E	124th Ave NE	NE 4th Pl to Main St	Add a 6 foot wide sidewalk and a 4 foot planter strip on the east side of 124th Avenue NE from NE 4th Place to Main Street.	High

Continued on following page

Continued from previous page

Type	Project #	Link	Limits	Description	Priority
Sidewalk	S-327-W	124th Ave NE	NE 2nd St to Main St	Add a 6 foot wide sidewalk and a 4 foot planter strip on the west side of 124th Avenue NE from NE 2nd Street to Main Street.	High
Sidewalk	S-328-E	118th Ave SE	Main Street to SE 4th Pl (Botanical Garden frontage)	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the east side of 118th Avenue SE from Main Street to SE 4th Place where not complete. (mainly Botanical Garden frontage)	High
Sidewalk	S-328-W	118th Ave SE	Main Street to SE 4th Pl (Botanical Garden frontage)	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the west side of 118th Avenue SE from Main Street to SE 4th Place where not complete. (mainly Botanical Garden frontage)	High
Sidewalk	S-329-E	114th Ave SE	SE 6th to SE 8th St	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the east side of 114th Avenue SE from SE 6th Street to SE 8th Street.	High
Sidewalk	S-329-W	114th Ave SE	SE 6th to SE 8th St	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the west side of 114th Avenue SE from SE 6th Street to SE 8th Street.	High
Sidewalk	S-330-N	SE 8th St	121th Ave SE to Lake Hills Connector	Add a 6 foot-wide sidewalk and a 4 foot-wide planter strip on the north side of SE 8th Street from 121st Avenue SE to Lake Hills Connector.	High
Sidewalk	S-330-S	SE 8th St	114th Ave/118th Ave SE to 121st Avenue SE	Add a 6 foot-wide sidewalk and a 4 foot-wide planter strip on the south side of SE 8th Street from 114th Avenue SE/118th Avenue SE to 121st Avenue SE.	High
Sidewalk	S-331-N	SE 7th Pl	Lake Hills Connector to 128th Ave SE	Add a 6 foot wide sidewalk and a 4 foot wide planter strip along the north side of SE 7th Place from Lake Hills Connector to 128th Avenue SE where not complete.	High
Sidewalk	S-333-N	Lake Hills Blvd	143rd Ave SE to SE 12th Pl	Add a 6 foot-wide sidewalk and a 4 foot-wide planter strip on the north side of Lake Hills Boulevard from 143rd Avenue SE to SE 12th Place where not complete, while preserving the existing on-street bicycle facility.	High
Sidewalk	S-333-S	Lake Hills Blvd	144th Ave SE to SE 12th Pl	Add a 6 foot-wide sidewalk and a 4 foot-wide planter strip on the south side of Lake Hills Boulevard from 143rd Avenue SE to SE 12th Place, while preserving the existing on-street bicycle facility.	High
Sidewalk	S-334-N	Lake Hills Blvd	155th Ave SE to 156th Ave SE	Add a 6 foot-wide sidewalk and a 4 foot-wide planter strip along the north side of Lake Hills Boulevard from 155th Avenue SE to 156th Avenue SE, while preserving the existing on-street bicycle facility.	High
Sidewalk	S-335-S	SE 6th St	100th Ave SE to 102nd Ave SE	Add a 6 foot wide sidewalk and a 4 foot wide planter strip along the south side of SE 6th Street from 100th Avenue SE to 102nd Avenue SE.	High
Sidewalk	S-338-E	SE 20th Pl/128th Ave SE	123rd Ave SE to SE 30th St	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the east side of SE 20th Place and 128th Avenue SE from 123rd Avenue SE to SE 30th Street where not complete, while preserving the existing on-street bicycle facility.	High
Sidewalk	S-338-W	SE 20th Pl/128th Ave SE	123rd Ave SE to SE 32nd St	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the west side of SE 20th Place and 128th Avenue SE from 123rd Avenue SE to SE 32nd Street where not complete, while preserving the existing on-street bicycle facility.	High
Sidewalk	S-344-E	145th Pl SE	SE 24th St to Landerholm Cir SE (BCC campus)	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the east side of 145th Place SE from SE 24th Street to Landerholm Circle SE and the Bellevue Community College campus.	High
Sidewalk	S-344-W	145th Pl SE	SE 24th St to Landerholm Cir SE (BCC campus)	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the west side of 145th Place SE from SE 24th Street to Landerholm Circle SE and the Bellevue Community College campus where not complete.	High
Sidewalk	S-345-N	SE 24th St	145th Pl SE to 148th Ave SE	Add a 6 foot wide sidewalk and a 4 foot wide planter strip along the north side of SE 24th Street from 145th Place SE to 148th Avenue SE where not complete.	High
Sidewalk	S-346-N	SE 16th St	148th Ave SE to 156th Ave SE	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the north side of SE 16th Street from 148th Avenue SE to 156th Avenue SE where not complete.	High
Sidewalk	S-346-S	SE 16th St	148th Ave SE to 156th Ave SE	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the south side of SE 16th Street from 148th Avenue SE to 156th Avenue SE where not complete.	High
Sidewalk	S-348-N	Phillips Hill Rd (SE 35th Pl and SE 34th St)	162nd Pl SE to 168th Pl SE	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the north side of Phillips Hills Road (SE 35th Place and SE 34th Street) from 162nd Place SE to 168th Place SE.	High
Sidewalk	S-353-N	SE 40th Ln	Factoria Blvd to 133rd Ave SE	Add a 6 foot sidewalk and a 4 foot planter strip on the north side of SE 40th Lane from Factoria Boulevard to 131st Avenue SE.	High
Sidewalk	S-353-S	SE 40th Ln	Factoria Blvd to 133rd Ave SE	Add a 6 foot sidewalk and a 4 foot planter strip on the south side of SE 40th Lane from Factoria Boulevard to 131st Avenue SE.	High
Sidewalk	S-364-N	SE 60th St	112th Ave SE/Lake Washington Blvd to 120th Ave SE	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the north side of SE 60th Street from 112th Avenue SE/Lake Washington Boulevard to 120th Avenue SE where not complete.	High
Sidewalk	S-364-S	SE 60th St	114th Pl SE to 116th Ave SE	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the south side of SE 60th Street from 114th Place SE to 116th Avenue SE where not complete.	High
Sidewalk	S-367-E	123rd Ave SE	SE 60th St to SE 64th Pl	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the east side of 123rd Avenue SE from SE 60th Street to SE 64th Place where not complete, while preserving the existing on-street bicycle facility.	High
Sidewalk	S-367-W	123rd Ave SE	SE 60th St to SE 64th Pl	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the west side of 123rd Avenue SE from SE 60th Street to SE 64th Place where not complete, while preserving the existing on-street bicycle facility.	High
Sidewalk	S-368-N	SE 60th St	126th Ave SE to 129th Ave SE	Add a 6 foot wide sidewalk on the north side of SE 60th Street from 126th Avenue SE to 129th Avenue SE where not complete.	High
Sidewalk	S-368-S	SE 60th St	123rd Ave SE to 129th Ave SE	Add a 6 foot wide sidewalk on the south side of SE 60th Street from 123rd Avenue SE to 129th Avenue SE where not complete.	High
Sidewalk	S-377-S	Coal Creek Pkwy	I-405 to Factoria Blvd SE	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the south side of Coal Creek Parkway from Factoria Boulevard SE to I-405.	High
Sidewalk	S-378-N	Eastgate Way	Richards Rd to 139th Ave SE	Add a 6 foot wide sidewalk and 4 foot wide planter strip on the north side of Eastgate Way from Richards Road to 139th Avenue SE where not complete.	High
Sidewalk	S-414-N	NE 5th St	120th Ave NE to 124th Ave NE	Add a 5 foot wide sidewalk on the north side of NE 5th Street from 120th Avenue NE to 124th Avenue NE.	High
Sidewalk	S-414-S	NE 5th St	120th Ave NE to 123rd Ave NE	Add a 5 foot wide sidewalk on south side of NE 5th Street from 120th Avenue NE to 123rd Avenue NE where not complete.	High
Sidewalk	S-418-N	NE 6th St	148th Ave NE to 164th Ave NE	Add a 5 foot wide sidewalk along the north side of NE 6th Street from 148th Avenue NE to 164th Avenue NE.	High
Sidewalk	S-419-E	160th Ave NE/158th Pl NE/SE	NE 4th St to SE 16th St	Add a 5 foot wide sidewalk on the east side of 160th Avenue NE and 158th Place NE/SE from NE 4th Street to SE 16th Street where not complete.	High
Sidewalk	S-419-W	160th Ave NE/158th Pl NE/SE/160th Ave SE	NE 4th St to Phantom Way	Add a 5 foot wide sidewalk on the west side of 160th Avenue NE, 158th Place NE/ SE, and 160th Avenue SE from NE 4th Street to Phantom Way where not complete.	High

Continued on following page

Continued from previous page

Type	Project #	Link	Limits	Description	Priority
Sidewalk	S-423-S	Meydenbauer Way SE	SE Bellevue Pl to 101st Ave SE	Add a 5 foot wide sidewalk on the south side of Meydenbauer Way SE from SE Bellevue Place to 101st Avenue SE where not complete.	High
Sidewalk	S-425-E	105th Ave SE	SE Cliff Pl to Wolverine Way (high school)	Add a 5 foot wide sidewalk on the east side of 105th Avenue SE from SE Cliff Place to Wolverine Way (high school) where not complete.	High
Sidewalk	S-425-W	105th Ave SE	SE Cliff Pl to Wolverine Way (high school)	Add a 5 foot wide sidewalk on the west side of 105th Avenue SE from SE Cliff Place to Wolverine Way (high school) where not complete.	High
Sidewalk	S-428-N	SE 5th St	118th Ave SE to Wilburton Hill Community Park	Add a 5 foot-wide sidewalk on the north side of SE 5th Street from 118th Avenue SE to Wilburton Hill Community Park where not complete.	High
Sidewalk	S-429-S	SE 7th Pl	Lake Hills Connector to 128th Ave SE	Add a 5 foot wide sidewalk along the south side of SE 7th Place from Lake Hills Connector to 128th Avenue SE where not complete.	High
Sidewalk	S-430-S	Lake Hills Connector	134th Ave SE (Bannerwood Sports Park) to 140th Ave SE	Add a 5 foot wide sidewalk on the south side of Lake Hills Connector from 134th Avenue SE (Bannerwood Sports Park) to 140th Avenue SE.	High
Sidewalk	S-431-N	SE 6th St	100th Ave SE to Bellevue Way SE	Add a 5 foot wide sidewalk along the north side of SE 6th Street from 100th Avenue SE to Bellevue Way SE where not complete.	High
Sidewalk	S-431-S	SE 6th St	102th Ave SE to Bellevue Way SE	Add a 5 foot wide sidewalk along the south side of SE 6th Street from 102nd Avenue SE to Bellevue Way SE where not complete.	High
Sidewalk	S-435-N	SE 16th St	104th Ave SE to 108th Ave SE	Add a 5 foot wide sidewalk on the north side of SE 16th Street from 104th Avenue SE to 108th Avenue SE where not complete.	High
Sidewalk	S-435-S	SE 16th St	104th Ave SE to 108th Ave SE	Add a 5 foot wide sidewalk on the south side of SE 16th Street from 104th Avenue SE to 108th Avenue SE.	High
Sidewalk	S-436-W	107th Ave SE	Bellevue Way SE to SE 20th St	Add a 5 foot wide sidewalk along the west side of 107th Avenue SE from Bellevue Way SE to SE 20th Street with a planter strip where feasible.	High
Sidewalk	S-443-E	120th Ave SE	SE 35th St to Lake Washington Blvd	Add a 5 foot wide sidewalk on the east side of 120th Avenue SE from SE 35th Street to Lake Washington Boulevard.	High
Sidewalk	S-443-W	120th Ave SE	SE 35th St to Lake Washington Blvd	Add a 5 foot wide sidewalk on the west side of 120th Avenue SE from SE 35th Street to Lake Washington Boulevard.	High
Sidewalk	S-448-E	130th Ave SE/130th Pl SE	Newport Way to SE 48th Pl	Add a 5 foot wide sidewalk on the east side of 130th Avenue SE and 130th Place SE from Newport Way to SE 48th Place where not complete.	High
Sidewalk	S-465-E	112th Ave SE	SE 30th St to SE 34th St	Add a 5 foot wide sidewalk on the east side of 112th Avenue SE from SE 30th Street to SE 34th Street.	High
Sidewalk	S-465-W	112th Ave SE	SE 30th St to SE 34th St	Add a 5 foot wide sidewalk on the west side of 112th Avenue SE from SE 30th Street to SE 34th Street where not complete.	High
Sidewalk	S-100-N	15th/16th St NE	NE 12th St to 140th Ave NE	Add a 12 foot wide sidewalk and a 4 foot wide planter strip on the north side of 15th/16th Street NE from NE 12th Street to 140th Avenue NE.	Medium
Sidewalk	S-100-S	15th/16th St NE	NE 12th St to 140th Ave NE	Add a 12 foot wide sidewalk and a 4 foot wide planter strip on the south side of 15th/16th Street NE from NE 12th Street NE to 140th Avenue NE.	Medium
Sidewalk	S-201-E	130th Ave NE	Northup Way to Bel-Red Rd	Add an 8 foot wide sidewalk and a 4 foot wide planter strip on the east side of 130th Avenue NE from Northup Way to Bel-Red Road where not complete.	Medium
Sidewalk	S-201-W	130th Ave NE	Northup Way to Bel-Red Rd	Add an 8 foot wide sidewalk and a 4 foot wide planter strip on the west side of 130th Avenue NE from Northup Way to Bel-Red Road where not complete.	Medium
Sidewalk	S-202-E	136th Pl NE	NE 20th St to NE 16th St	Add an 8 foot wide sidewalk and a 4 foot wide planter strip on the east side of 136th Place NE from NE 20th Street to NE 16th Street.	Medium
Sidewalk	S-202-W	136th Pl NE	NE 20th St to NE 16th St	Add an 8 foot wide sidewalk and a 4 foot wide planter strip on the west side of 136th Place NE from NE 20th Street to NE 16th Street.	Medium
Sidewalk	S-203-S	Bel-Red Rd	NE 32nd St (alignment) to NE 24th St	Add an 8 foot wide sidewalk and a 4 foot wide planter strip along the south side of Bel-Red Road from NE 32nd Street (alignment) to NE 24th Street where not complete.	Medium
Sidewalk	S-206-N	NE 3rd Pl	110th Ave NE to 111th Ave NE	Add an 8 foot wide sidewalk and a 4 foot wide planter strip on the north side of NE 3rd Place from 110th Avenue NE to 111th Avenue NE where not complete.	Medium
Sidewalk	S-206-S	NE 3rd Pl	110th Ave NE to 111th Ave NE	Add an 8 foot wide sidewalk and a 4 foot wide planter strip on the south side of NE 3rd Place from 110th Avenue NE to 111th Avenue NE where not complete.	Medium
Sidewalk	S-219-N	NE 2nd Pl	110th Ave NE to 111th Ave NE	Add an 8 foot wide sidewalk and a 4 foot wide planter strip on the north side of NE 2nd Place from 110th Avenue NE to 111th Avenue NE where not complete.	Medium
Sidewalk	S-219-S	NE 2nd Pl	108th Ave NE to 111th Ave NE	Add an 8 foot wide sidewalk and a 4 foot wide planter strip on the south side of NE 2nd Place from 108th Avenue NE to 111th Avenue NE where not complete.	Medium
Sidewalk	S-307-S	NE 24th St	98th Ave NE to Bellevue Way	Add a 6 foot wide sidewalk and a 4 foot wide planter strip along the south side of NE 24th Street from 98th Avenue NE to Bellevue Way.	Medium
Sidewalk	S-309-W	116th Ave NE	NE 21st St to NE 12th St	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the west side of 116th Avenue NE from NE 21st Street to NE 12th Street.	Medium
Sidewalk	S-322-E	156th Ave NE/SE	NE 6th St to Lake Hills Blvd	Add a 6 foot wide sidewalk on the east side of 156th Avenue NE/SE from NE 6th Street to Lake Hills Boulevard where not complete, while preserving the existing on-street bicycle facility.	Medium
Sidewalk	S-332-E	121st Ave SE/SE 12th St/123rd Ave SE	SE 8th St to SE 20th Pl	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the east side of 121st Avenue SE, SE 12th Street, and 123rd Avenue SE from SE 8th Street to SE 20th Pl.	Medium
Sidewalk	S-337-E	104th Ave SE	SE 8th St to SE 25th St	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the east side of 104th Avenue SE from SE 8th Street to SE 25th Street.	Medium
Sidewalk	S-337-W	104th Ave SE	SE 8th St to SE 25th St	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the west side of 104th Avenue SE from SE 8th Street to SE 25th Street.	Medium
Sidewalk	S-340-W	Bellevue Way SE	SE 27th Pl (alignment) to SE 30th St Connector	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the west side of Bellevue Way SE from SE 27th Place (alignment) to SE 30th Street Connector.	Medium
Sidewalk	S-342-S	Kamber Rd (SE 26th St)	Richards Rd (132nd Ave SE) to 138th Ave SE (Sunset Mini Park)	Add a 6 foot wide sidewalk and a 4 foot wide planter strip along the south side of Kamber Road from Richards Road to 138th Avenue SE and Sunset Mini Park where not complete, while preserving the existing on-street bicycle facility.	Medium
Sidewalk	S-354-N	SE Allen Rd	SE Newport Way to SE 38th St	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the north side of SE Allen Road from SE Newport Way to SE 38th Street, while preserving the existing on-street bicycle facility.	Medium

Continued on following page

Continued from previous page

Type	Project #	Link	Limits	Description	Priority
Sidewalk	S-354-S	SE Allen Rd	SE Newport Way to SE 38th St	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the south side of SE Allen Road from SE Newport Way to SE 38th Street, while preserving the existing on-street bicycle facility.	Medium
Sidewalk	S-356-W	130th Ave SE/130th Pl SE	Newport Way to SE 48th Pl	Add a 6 foot wide sidewalk and a 4 foot wide planter on west side of 130th Avenue SE and 130th Place SE from Newport Way to SE 48th Place where not complete.	Medium
Sidewalk	S-366-E	120th Ave SE	SE 60th St to SE 64th St	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the east side of 120th Avenue SE from SE 60th Street to SE 64th Street.	Medium
Sidewalk	S-366-W	120th Ave SE	SE 60th St to SE 64th St	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the west side of 120th Avenue SE from SE 60th Street to SE 64th Street.	Medium
Sidewalk	S-413-N	NE 7th St	126th Ave NE to 128th Ave NE	Add a 5 foot wide sidewalk on the north side of NE 7th Street from 126th Avenue NE to 128th Avenue NE.	Medium
Sidewalk	S-413-S	NE 7th St	126th Ave NE to 128th Ave NE	Add a 5 foot wide sidewalk on the south side of NE 7th Street from 126th Avenue NE to 128th Avenue NE.	Medium
Sidewalk	S-415-E	128th Ave NE/SE	NE 7th St to SE 7th Pl	Add a 5 foot wide sidewalk along the east side of 128th Avenue NE/SE from NE 7th Street to SE 7th Place.	Medium
Sidewalk	S-417-S	Main St	136th Ave to 140th Ave	Add a 5 foot-wide sidewalk on the south side of Main Street from 136th Avenue to 140th Avenue.	Medium
Sidewalk	S-426-W	109th Ave SE	SE 2nd St to SE 4th St	Add a 5 foot wide sidewalk on the west side of 109th Avenue SE from NE 2nd Street to SE 4th Street, while preserving the existing on-street bicycle facilitiy	Medium
Sidewalk	S-427-S	SE 4th St/111th Ave SE	109th Ave SE to 112th Ave SE	Add a 5 foot wide sidewalk on the south side of SE 4th Street and 111th Avenue SE from 109th Avenue SE to 112th Avenue SE where not complete, while preserving the existing on-street bicycle facility.	Medium
Sidewalk	S-433-E	102nd Ave SE	SE 6th St to SE 8th St	Add a 5 foot wide sidewalk on the east side of 102nd Avenue SE from SE 6th Street to SE 8th Street.	Medium
Sidewalk	S-433-W	102nd Ave SE	SE 6th St to SE 8th St	Add a 5 foot wide sidewalk on the west side of 102nd Avenue SE from SE 6th Street to SE 8th Street.	Medium
Sidewalk	S-434-N	SE 7th St/SE 8th St	99th Ave SE to Bellevue Way	Add a 5 foot wide sidewalk on the north side of SE 7th Street and SE 8th Street from 99th Avenue SE to Bellevue Way.	Medium
Sidewalk	S-434-S	SE 7th St/SE 8th St	99th Ave SE to Bellevue Way	Add a 5 foot wide sidewalk on the south side of SE 7th St and SE 8th Street from 99th Avenue SE to Bellevue Way.	Medium
Sidewalk	S-439-W	137th Ave SE	Kamber Rd(SE 26th St) to SE 24th St	Add a 5 foot wide sidewalk and a 4 foot wide planter strip on the west side of 137th Avenue SE from Kamber Rd to SE 24th Street.	Medium
Sidewalk	S-442-N	SE 32nd St	125th Ave SE to 128th Ave SE	Add a 5 foot wide sidewalk on the north side of SE 32nd Street from 125th Avenue SE to 128th Avenue SE.	Medium
Sidewalk	S-442-S	SE 32nd St	125th Ave SE to 128th Ave SE	Add a 5 foot wide sidewalk on the south side of SE 32nd Street from 125th Avenue SE to 128th Avenue SE.	Medium
Sidewalk	S-445-N	SE 38th St	154th Ave SE to 156th Ave SE	Add a 5 foot wide sidewalk on the north side of SE 38th Street from 154th Avenue SE to 156th Avenue SE, while preserving the existing on-street bicycle facility.	Medium
Sidewalk	S-445-S	SE 38th St	154th Ave SE to 156th Ave SE	Add a 5 foot wide sidewalk on the south side of SE 38th Street from 154th Avenue SE to 156th Avenue SE, while preserving the existing on-street bicycle facility.	Medium
Sidewalk	S-446-E	156th Ave SE/SE 42nd St	SE 38th St to 153rd Ave SE	Add a 5 foot wide sidewalk on the east side of 156th Avenue SE and the south side of SE 42nd Street from SE 38th St to 153rd Avenue SE, while preserving the existing on-street bicycle facility.	Medium
Sidewalk	S-446-W	156th Ave SE/SE 42nd S/153rd Ave SE	SE 38th St to SE Newport Way	Add a 5 foot wide sidewalk on the west side of 156th Avenue SE, the north side of SE 42nd Street, and the west side of 153rd Avenue SE from SE 38th St to SE Newport Way, while preserving the existing on-street bicycle facility.	Medium
Sidewalk	S-452-E	123rd Ave SE	150 feet north of SE 52nd St (approx) to SE 56th St	Add a 5 foot wide sidewalk on the east side of 123rd Avenue SE from 150 feet north of SE 52nd Street (approx) to SE 56th Street.	Medium
Sidewalk	S-452-W	123rd Ave SE	151 feet north of SE 52nd St (approx) to SE 56th St	Add a 5 foot wide sidewalk on the west side of 123rd Avenue SE from 150 feet north of SE 52nd Street (approx) to SE 56th Street.	Medium
Sidewalk	S-454-N	SE 56th St	119th Ave SE to 128th Ave SE	Add a 5 foot wide sidewalk on the north side of SE 56th Street from 119th Avenue SE to 128th Avenue SE where not complete.	Medium
Sidewalk	S-454-S	SE 56th St	126th Ave SE to 128th Ave SE	Add a 5 foot wide sidewalk on the south side of SE 56th Street from 126th Avenue SE to 128th Avenue SE where not complete.	Medium
Sidewalk	S-456-E	126 Ave SE	SE 56th St to SE 60th St	Add a 5 foot wide sidewalk on the east side of 126th Avenue SE from SE 56th Street to SE 60th Street where not complete.	Medium
Sidewalk	S-456-W	126 Ave SE	SE 56th St to SE 59th St	Add a 5 foot wide sidewalk on the west side of 126th Avenue SE from SE 56th Street to SE 59th Street where not complete.	Medium
Sidewalk	S-463-N	SE 30th St Connector	112th Ave SE to Bellevue Way	Add a 5 foot wide sidewalk on the north side of SE 30th Street connector from 112th Avenue SE to Bellevue Way.	Medium
Sidewalk	S-463-S	SE 30th St Connector	112th Ave SE to Bellevue Way	Add a 5 foot wide sidewalk on the south side of SE 30th Street connector from 112th Avenue SE to Bellevue Way where not complete.	Medium
Sidewalk	S-464-E	Snoqualimie River Road Connection	SE 24th Street to SE 28th Street alignment	Add a 5 foot-wide sidewalk along the east side of Snoqualimie River Road from SE 24th Street to SE 28th Street alignment.	Medium
Sidewalk	S-315-S	NE 20th St	Bellevue Way to 108th Ave NE	Add a 6 foot wide sidewalk and a 4 foot wide planter strip along the south side of NE 20th Street from Bellevue Way to 108th Avenue NE.	Low

Continued on following page

Continued from previous page

Type	Project #	Link	Limits	Description	Priority
Sidewalk	S-320-N	NE 4th St Extension	116th Ave NE to 120th Ave NE	Add a 6 foot-wide sidewalk and 4 foot wide planter strip on the north side of NE 4th Street Extension from 116th Avenue NE to 120th Avenue NE.	Low
Sidewalk	S-320-S	NE 4th St Extension	116th Ave NE to 120th Ave NE	Add a 6 foot-wide sidewalk and 4 foot wide planter strip on the south side of NE 4th Street Extension from 116th Avenue NE to 120th Avenue NE.	Low
Sidewalk	S-323-S	NE 4th St	156th Ave NE to 164th Ave NE	Add a 6 foot wide sidewalk and a 4 foot wide planter strip along the south side of NE 4th Street from 156th Avenue NE to 164th Avenue NE.	Low
Sidewalk	S-325-S	Main St	159th Ave to 164th Ave	Add a 6 foot wide sidewalk and a 4 foot wide planter strip along the south side of Main Street from 159th Avenue to 164th Avenue where not complete, while preserving the existing on-street bicycle facility.	Low
Sidewalk	S-362-N	Lake Washington Blvd SE at I-405	I-405 overpass	Add a 6 foot wide sidewalk and a 4 foot wide planter strip on the north side of Lake Washington Boulevard SE at the I-405 overpass.	Low
Sidewalk	S-369-E	112th Avenue SE/SE 68th St/SE 69th Way (SE Newport Way)	SE 64th St to Coal Creek Pkwy	Add a 6 foot-wide sidewalk and a 4 foot-wide planter on the east side of 112th Avenue SE and the north side of SE 68th Street/SE 69th Way(SE Newport Way) from SE 64th Street to Coal Creek Parkway where not complete, while preserving the existing on-street bicycle facility.	Low
Sidewalk	S-376-W	115th Ave NE	railroad tracks, under I-405 to 116th Ave NE	Add a 6 foot wide sidewalk and a 4 foot wide planter strip along the west side of 115th Avenue NE from the railroad tracks, under I-405, to 116th Avenue NE.	Low
Sidewalk	S-408-N	NE 20th St	Bellevue Way to 108th Ave NE	Add a 5 foot wide sidewalk along the north side of NE 20th Street from Bellevue Way to 108th Avenue NE.	Low
Sidewalk	S-409-N	NE 17th St	Bellevue Way to 108th Ave NE	Add a 5 foot wide sidewalk along the north side of NE 17th Street from Bellevue Way to 108th Avenue NE where not complete.	Low
Sidewalk	S-409-S	NE 17th St	Bellevue Way to 108th Ave NE	Add a 5 foot wide sidewalk along the south side of NE 17th Street from Bellevue Way to 108th Avenue NE where not complete.	Low
Sidewalk	S-420-N	NE 4th St	156th Ave NE to 164th Ave NE	Add a 5 foot wide sidewalk along the north side of NE 4th Street from 156th Avenue NE to 164th Avenue NE.	Low
Sidewalk	S-421-N	Main St	156th Ave to 164th Ave	Add a 5 foot wide sidewalk along the north side of Main Street from 156th Avenue to 164th Avenue, while preserving the existing on-street bicycle facility.	Low
Sidewalk	S-444-S	SE 37th St/I-90 south Frontage Road	150th Ave SE to 164th Ave SE	Add a 5 foot-wide sidewalk on the south side of SE 37th Street and I-90 South Frontage Road from 150th Avenue SE to 164th Avenue SE.	Low

Appendix Table 2 Transit priority bicycle projects.

Type	Project #	Link	Limits	Description	Priority
Bicycle	B-100-N	Northup Way	Bellevue Way to 120th Ave NE	Add a 5 foot-wide bike lane on the north side of Northup Way from Bellevue Way to 120th Avenue NE.	High
Bicycle	B-100-S	Northup Way	Bellevue Way to 120th Ave NE	Add a 5 foot-wide bike lane on the south side of Northup Way from Bellevue Way to 120th Avenue NE.	High
Bicycle	B-101-E	108th Ave NE/NE 38th St	northern city limits to Northup Way	Add a 5 foot-wide bike lane on the east side of 108th Avenue NE and NE 38th Street from the northern city limits to Northup Way. Component of priority bike corridor; NS-2: Lake Washington Loop Trail.	High
Bicycle	B-101-W	108th Ave NE/NE 38th St	northern city limits to Northup Way	Add a 5 foot-wide bike lane on the west side of 108th Avenue NE and NE 38th Street from the northern city limits to Northup Way. Component of priority bike corridor; NS-2: Lake Washington Loop Trail.	High
Bicycle	B-104-E	112th Ave NE	Northup Way to NE 12th St	Add a 5 foot-wide bike lane on the east side of 112th Avenue NE from Northup Way to NE 12th Street. Component of priority bike corridor; NS-2: Lake Washington Loop Trail.	High
Bicycle	B-104-W	112th Ave NE	Northup Way to NE 12th St	Add a 5 foot-wide bike lane on the west side of 112th Avenue NE from Northup Way to NE 12th Street. Component of priority bike corridor; NS-2: Lake Washington Loop Trail.	High
Bicycle	B-112-E	140th Ave NE	NE 24th St to NE 8th St	Add 5 foot-wide bike lanes on the east side of 140th Avenue NE between NE 24th Street and NE 8th Street. Component of priority bike corridor; NS-4: Somerset-Redmond Connection.	High
Bicycle	B-112-W	140th Ave NE	NE 24th St to NE 8th St	Add 5 foot-wide bike lanes on the west side of 140th Avenue NE between NE 24th Street and NE 8th Street. Component of priority bike corridor; NS-4: Somerset-Redmond Connection.	High
Bicycle	B-115-E	Bel-Red Rd	156th Ave NE to NE 20th St	Add a 5 foot-wide bike lane on the east side of Bel-Red Road from 156th Avenue NE to NE 20th Street.	High
Bicycle	B-115-W	Bel-Red Rd	156th Ave NE to NE 20th St	Add a 5 foot-wide bike lane on the west side of Bel-Red Road from 156th Avenue NE to NE 20th Street.	High
Bicycle	B-117-N	Northup Way	NE 8th St to 156th Ave NE	Add a 5 foot-wide bike lane on the north side of Northup Way from NE 8th Street to 156th Avenue NE.	High
Bicycle	B-117-S	Northup Way	NE 8th St to 156th Ave NE	Add a 5 foot-wide bike lane on the south side of Northup Way from NE 8th Street to 156th Avenue NE.	High
Bicycle	B-119-E	120th Ave NE	Northup Way to NE 4th Street	Add a 5 foot-wide bike lane on the east side of 120th Avenue NE from Northup Way to the NE 4th Street extension.	High
Bicycle	B-119-W	120th Ave NE	Northup Way to NE 4th Street	Add a 5 foot-wide bike lane on the west side of 120th Avenue NE from Northup Way to the NE 4th Street extension.	High
Bicycle	B-120-E	124th Ave NE	West Tributary Trail to Main St	Add a 5 foot-wide bike lane on the east side of 124th Avenue NE from West Tributary Trail to Main Street.	High
Bicycle	B-120-W	124th Ave NE	West Tributary Trail to Main St	Add a 5 foot-wide bike lane on the west side of 124th Avenue NE from West Tributary Trail to Main Street.	High
Bicycle	B-126-E	112th Ave NE	NE 12th St to NE 6th St	Add a 5 foot-wide bike lane on the east side of 112th Avenue NE from NE 12th Street to NE 6th Street. Component of priority bike corridor; NS-2: Lake Washington Loop Trail.	High
Bicycle	B-126-W	112th Ave NE	NE 12th St to NE 6th St	Add a 5 foot-wide bike lane on the west side of 112th Avenue NE from NE 12th Street to NE 6th Street. Component of priority bike corridor; NS-2: Lake Washington Loop Trail.	High
Bicycle	B-127-E	114th Ave NE (Frontage Road)	NE 6th St to SE 8th St	Add a 5 foot-wide bike lane on the east side of 114th Avenue NE (Frontage Road), from NE 6th Street to SE 8th Street. Implement mid-block connections through redevelopment and complete a 10 foot connection along the north side of the NE 6th Street HOV ramp. Preserve opportunities for an off-street multi-purpose pathway between NE 6th Street and SE 8th Street in the event the facilities are displaced by future improvements to I-405. Improvements in this segment are constrained by I-405 to the east and an existing stream channel to the west. Component of priority bike corridor; NS-2: Lake Washington Loop Trail.	High
Bicycle	B-127-W	114th Ave NE (Frontage Road)	NE 6th St to SE 8th St	Add a 5 foot-wide bike lane on the west side of 114th Avenue NE (Frontage Road), from NE 6th Street to SE 8th Street. Implement mid-block connections through redevelopment and complete a 10 foot connection along the north side of the NE 6th Street HOV ramp. Preserve opportunities for an off-street multi-purpose pathway between NE 6th Street and SE 8th Street in the event the facilities are displaced by future improvements to I-405. Improvements in this segment are constrained by I-405 to the east and an existing stream channel to the west. Component of priority bike corridor; NS-2: Lake Washington Loop Trail.	High
Bicycle	B-129-N	Main St	Bellevue Way NE to 116th Ave NE	Add a 5 foot-wide bike lane on the north side of Main Street from Bellevue Way NE to 116th Avenue NE. Component of priority bike corridor; EW-3: Lake to Lake Trail.	High
Bicycle	B-134-N	Main St	NE 1st St to 124th Ave NE	Add a 5 foot-wide bike lane on the north side of Main Street from NE 1st Street to 124th Avenue NE.	High
Bicycle	B-135-N	SE 8th St	114th Ave SE to Lake Hills Connector	Add a 5 foot-wide bike lane on the north side of SE 8th Street from 114th Avenue SE to Lake Hills Connector. Component of priority bike corridor; EW-3: Lake to Lake Trail.	High
Bicycle	B-137-N	Bellevue Way	108th Ave SE to 112th Ave SE	Add a 5 foot-wide bike lane on the north side of Bellevue Way from 108th Avenue SE to 112th Avenue SE.	High
Bicycle	B-137-S	Bellevue Way	108th Ave SE to 112th Ave SE	Add a 5 foot-wide bike lane on the south side of Bellevue Way from 108th Avenue SE to 112th Avenue SE.	High
Bicycle	B-141-N	SE 16th St	148th Ave SE to 156th Ave SE	Add a 5 foot-wide bike lane on the north side of SE 16th Street from 148th Avenue SE to 156th Avenue SE. Component of priority bike corridor; EW-3: Lake to Lake Trail.	High
Bicycle	B-141-S	SE 16th St	148th Ave SE to 156th Ave SE	Add a 5 foot-wide bike lane on the south side of SE 16th Street from 148th Avenue SE to 156th Avenue SE. Component of priority bike corridor; EW-3: Lake to Lake Trail.	High
Bicycle	B-142-N	SE 24th St	145th Pl SE to 148th Ave SE	Add a 5 foot-wide bike lane on the north side of SE 24th Street from 145th Place SE to 148th Avenue SE.	High
Bicycle	B-142-S	SE 24th St	145th Pl SE to 148th Ave SE	Add a 5 foot-wide bike lane on the south side of SE 24th Street from 145th Place SE to 148th Avenue SE.	High
Bicycle	B-144-S	Eastgate Way	Richards Road to 148th Ave SE	Add a 5 foot-wide bike lane on the south side of Eastgate Way from Richards Road (132nd Avenue SE) to 148th Avenue SE.	High
Bicycle	B-145-S	SE 32nd St	139th Ave SE to 142nd Ave SE	Add a 5 foot wide bike lane on the south side of SE 32nd Street from 139th Avenue SE to 142nd Avenue SE.	High
Bicycle	B-147-N	Eastgate Way	148th Ave SE to Phillips Hill Rd (SE 35th St)	Add a 5 foot-wide bike lane on the north side of Eastgate Way from 148th Avenue SE to Phillips Hill Road (SE 35th Street).	High
Bicycle	B-147-S	Eastgate Way	148th Ave SE to Phillips Hill Rd (SE 35th St)	Add a 5 foot-wide bike lane on the south side of Eastgate Way from 148th Avenue SE to Phillips Hill Road (SE 35th Street).	High
Bicycle	B-202-E	100th Ave NE	NE 24th St to NE 8th St	Add a wide bike shoulder on east side of 100th Avenue NE from NE 24th Street to NE 8th Street.	High
Bicycle	B-202-W	100th Ave NE	NE 24th St to NE 8th St	Add a wide bike shoulder on the west side of 100th Avenue NE from NE 24th Street to NE 8th Street.	High
Bicycle	B-205-N	NE 24th St	Bel-Red Rd to 172nd Ave NE	Add a wide bike shoulder on the north side of NE 24th Street from Bel-Red Road to 172nd Avenue NE, in front of Ardmore Park.	High
Bicycle	B-205-S	NE 24th St	Bel-Red Rd to 172nd Ave NE	Add a wide bike shoulder on the south side of NE 24th Street from Bel-Red Road to 172nd Avenue NE, in front of Ardmore Park.	High

Continued on following page

Continued from previous page

Type	Project #	Link	Limits	Description	Priority
Bicycle	B-210-N	Main St	100th Ave NE to Bellevue Way NE	Add a wide bike shoulder on the north side of Main Street from 100th Avenue NE to Bellevue Way NE. Component of priority bike corridor; EW-3: Lake to Lake Trail.	High
Bicycle	B-210-S	Main St	100th Ave NE to Bellevue Way NE	Add a wide bike shoulder on the south side of Main Street from 100th Avenue NE to Bellevue Way NE. Component of priority bike corridor; EW-3: Lake to Lake Trail.	High
Bicycle	B-212-S	Lake Hills Connector	Main St to 140th Ave SE	Add a wide bike shoulder on the south side of Lake Hills Connector from Main Street to 140th Avenue SE where not complete. Component of priority bike corridor; EW-3: Lake to Lake Trail.	High
Bicycle	B-213-N	SE 16th St	104th Ave SE to 108th Ave SE	Add a wide bike shoulder on the north side of SE 16th Street from 104th Avenue SE to 108th Avenue SE.	High
Bicycle	B-213-S	SE 16th St	104th Ave SE to 108th Ave SE	Add a wide bike shoulder on the south side of SE 16th Street from 104th Avenue SE to 108th Avenue SE.	High
Bicycle	B-400-S	NE 24th St	140th Ave NE to 148th Ave NE	Add a wide outside lane on the south side of NE 24th Street from 140th Avenue NE to 148th Avenue NE where not complete. Portion from 140th Ave NE to NE 29th Place is a component of priority bike corridor; NS-4: Somerset-Redmond Connection.	High
Bicycle	B-404-E	139th Ave SE	Eastgate Way to the southern edge of Sunset Mini Park	Add a wide outside lane on the east side of 139th Avenue SE from Eastgate Way to the southern edge of Sunset Mini Park where not complete.	High
Bicycle	B-404-W	139th Ave SE	Eastgate Way to the southern edge of Sunset Mini Park	Add a wide outside lane on the west side of 139th Avenue SE from Eastgate Way to the southern edge of Sunset Mini Park where not complete.	High
Bicycle	B-501-E	160th Ave NE	Crossroads Park and Community Center to NE 8th St	Add a shared wide outside lane on the east side of 160th Avenue NE from Crossroads Park and Community Center to NE 8th Street.	High
Bicycle	B-501-W	160th Ave NE	Crossroads Park and Community Center to NE 8th St	Add a shared wide outside lane on the west side of 160th Avenue NE from Crossroads Park and Community Center to NE 8th Street.	High
Bicycle	B-502-N	Lake Hills Blvd	156th Ave SE to 159th Pl SE	Add a shared wide outside lane on the north side of Lake Hills Boulevard from 156th Avenue SE to 159th Place SE.	High
Bicycle	B-106-S	NE 40th St	140th Ave NE to 148th Ave NE	Convert the existing wide shoulder on the south side NE 40th Street from 140th Avenue NE to 148th Avenue NE into a bicycle climbing lane.	Medium
Bicycle	B-108-E	Bellevue Way	NE 24th St to NE 12th St	Convert the existing wide shoulder on the south side NE 40th Street from 140th Avenue NE to 148th Avenue NE into a bicycle climbing lane.	Medium
Bicycle	B-108-W	Bellevue Way	NE 24th St to NE 12th St	Add a 5 foot-wide bike lane on east side of Bellevue Way from NE 24th Street to NE 12th Street.	Medium
Bicycle	B-109-E	116th Ave NE	Northup Way to Main St	Add a 5 foot-wide bike lane on the west side of Bellevue Way from NE 24th Street to NE 12th Street.	Medium
Bicycle	B-109-W	116th Ave NE	Northup Way to Main St	Add a 5 foot-wide bike lane on the east side of 116th Avenue NE between Main Street and Northup Way.	Medium
Bicycle	B-111-N	Northup Way/NE 20th St	124th Ave NE to 140th Ave NE	Add a 5 foot-wide bike lane on the north side of Northup Way/NE 20th Street from 124th Avenue NE to 140th Avenue NE. Component of priority bike corridor; EW-2: Downtown-Overlake Connection.	Medium
Bicycle	B-111-S	Northup Way/NE 20th St	124th Ave NE to 140th Ave NE	Add a 5 foot-wide bike lane on the south side of Northup Way/NE 20th Street from 124th Avenue NE to 140th Avenue NE. Component of priority bike corridor; EW-2: Downtown-Overlake Connection.	Medium
Bicycle	B-114-N	Bel-Red Rd	NE 40th St to 156th Ave NE	Add a 5 foot-wide bike lane on the north side of Bel-Red Road from NE 40th Street to 156th Avenue NE.	Medium
Bicycle	B-114-S	Bel-Red Rd	NE 40th St to 156th Ave NE	Add a 5 foot-wide bike lane on the south side of Bel-Red Road from NE 40th Street to 156th Avenue NE.	Medium
Bicycle	B-116-N	NE 20th St	Bel-Red Rd to 156th Ave NE	Add a 5 foot-wide bike lane on the north side of NE 20th Street from Bel-Red Road to 156th Avenue NE.	Medium
Bicycle	B-116-S	NE 20th St	Bel-Red Rd to 156th Ave NE	Add a 5 foot-wide bike lane on the south side of NE 20th Street from Bel-Red Road to 156th Avenue NE.	Medium
Bicycle	B-118-S	NE 12th St	100th Ave NE to 112th Ave NE	Add a 5 foot-wide bike lane on the south side of NE 12th Street from 100th Avenue NE to 112th Avenue NE. Component of priority bike corridor; EW-2: Downtown-Overlake Connection.	Medium
Bicycle	B-121-E	136th Pl NE	NE 16th St to NE 20th St	Add a 5 foot-wide bike lane on the east side of 136 Place NE from NE 16th Street to NE 20th Street. Component of priority bike corridor; EW-2: Downtown-Overlake Connection.	Medium
Bicycle	B-121-W	136th Pl NE	NE 16th St to NE 20th St	Add a 5 foot-wide bike lane on the west side of 136 Place NE from NE 16th Street to NE 20th Street. Component of priority bike corridor; EW-2: Downtown-Overlake Connection.	Medium
Bicycle	B-125-E	108th Ave NE	NE 12th St to Main Street	Add a 5 foot-wide bike lane on the east side of 108th Avenue NE from NE 12th Street to Main Street. Component of priority bike corridor; NS-1: Enatai-Northtown Connection.	Medium
Bicycle	B-125-W	108th Ave NE	NE 12th St to Main Street	Add a 5 foot-wide bike lane on the west side of 108th Avenue NE from NE 12th Street to Main Street. Component of priority bike corridor; NS-1: Enatai-Northtown Connection.	Medium
Bicycle	B-133-S	SE 5th St	116th Ave SE to BNSF corridor	Add a 5 foot wide bike lane on the south side of SE 5th Street from 116th Avenue SE to the BNSF corridor.	Medium
Bicycle	B-146-E	142nd Pl SE	SE 28th St to SE 36th St	Add a 5 foot-wide bike lane on the east side of 142nd Place SE from SE 28th Street to SE 36th Street.	Medium
Bicycle	B-146-W	142nd Pl SE	SE 28th St to SE 36th St	Add a 5 foot-wide bike lane on the west side of 142nd Place SE from SE 28th Street to SE 36th Street.	Medium
Bicycle	B-149-E	124th Ave SE/SE 38th St	SE 38th St at Factoria Blvd SE to 124th St at SE 41st Pl	Add a 5 foot-wide bike lane on the east side of 124th Avenue SE from SE 41st Place to SE 36th Street and on the south side of SE 38th Street from 124th Avenue SE to Factoria Boulevard.	Medium
Bicycle	B-149-W	124th Ave SE/SE 38th St	SE 38th St at Factoria Blvd SE to 124th St at SE 41st Pl	Add a 5 foot-wide bike lane on the west side of 124th Avenue SE from SE 41st Place to SE 36th Street and on the north side of SE 38th Street from 124th Avenue SE to Factoria Boulevard.	Medium
Bicycle	B-151-E	Factoria Blvd/SE Newport Way	Coal Creek Pkwy to 129th Pl SE	Add a 5 foot-wide bike lane on the east side of Factoria Boulevard and SE Newport Way from Coal Creek Parkway to 129th Place SE.	Medium
Bicycle	B-151-W	Factoria Blvd/SE Newport Way	Coal Creek Pkwy to 129th Pl SE	Add a 5 foot-wide bike lane on the west side of Factoria Boulevard and SE Newport Way from Coal Creek Parkway to 129th Place SE.	Medium
Bicycle	B-153-E	Lake Washington Blvd SE	106th Ave SE to SE 60th St	Add a 5 foot-wide bike lane on the east side of Lake Washington Boulevard SE from 106th Avenue SE to SE 60th Street where not complete. Component of priority bike corridor; EW-5: Coal Creek-Cougar Mountain Connection.	Medium

Continued on following page

Continued from previous page

Type	Project #	Link	Limits	Description	Priority
Bicycle	B-153-W	Lake Washington Blvd SE	106th Ave SE to SE 60th St	Add a 5 foot-wide bike lane on the west side of Lake Washington Boulevard SE from 106th Avenue SE to SE 60th Street where not complete. Component of priority bike corridor; EW-5: Coal Creek-Cougar Mountain Connection.	Medium
Bicycle	B-157-N	SE 60th St	Lake Washington Blvd to Coal Creek Pkwy	Add a 5 foot-wide bike lane on the north side of SE 60th Street from Lake Washington Boulevard to 129th Avenue SE; and then only on the north side from 129th Avenue SE to Coal Creek Parkway. Component of priority bike corridor; EW-5: Coal Creek-Cougar Mountain Connection.	Medium
Bicycle	B-157-S	SE 60th St	Lake Washington Blvd to Coal Creek Pkwy	Add a 5 foot-wide bike lane on the south side of SE 60th Street from Lake Washington Boulevard to 129th Avenue SE; and then only on the north side from 129th Avenue SE to Coal Creek Parkway. Component of priority bike corridor; EW-5: Coal Creek-Cougar Mountain Connection.	Medium
Bicycle	B-201-N	NE 24th St	Bellevue Way NE to 112th Ave NE	Add a wide bike shoulder on the north side of NE 24th Street from Bellevue Way to 112th Avenue NE. Component of priority bike corridor; NS-1: Enatai-Northtown Connection.	Medium
Bicycle	B-201-S	NE 24th St	Bellevue Way NE to 112th Ave NE	Add a wide bike shoulder on the south side of NE 24th Street from Bellevue Way to 112th Avenue NE. Component of priority bike corridor; NS-1: Enatai-Northtown Connection.	Medium
Bicycle	B-204-E	108th Ave NE	NE 24th St to NE 12th St	Add a wide bike shoulder on the east side where not complete on 108th Avenue NE from NE 24th Street to NE 12th Street. Component of priority bike corridor; NS-1: Enatai-Northtown Connection.	Medium
Bicycle	B-204-W	108th Ave NE	NE 24th St to NE 12th St	Add a wide bike shoulder on the west side where not complete on 108th Avenue NE from NE 24th Street to NE 12th Street. Component of priority bike corridor; NS-1: Enatai-Northtown Connection.	Medium
Bicycle	B-209-E	100th Ave NE	NE 8th St to Main St	Add a wide bike shoulder on the east side of 100th Avenue NE from Main Street to NE 8th Street.	Medium
Bicycle	B-209-W	100th Ave NE	NE 8th St to Main St	Add a wide bike shoulder on the west side of 100th Avenue NE from Main Street to NE 8th Street.	Medium
Bicycle	B-401-N	NE 2nd St	102nd Ave SE to 114th Ave NE	Add a wide outside lane on the north side of NE 2nd Street from 102nd Avenue SE to 114th Avenue NE.	Medium
Bicycle	B-401-S	NE 2nd St	102nd Ave SE to 114th Ave NE	Add a wide outside lane on the south side of NE 2nd Street from 102nd Avenue SE to 114th Avenue NE.	Medium
Bicycle	B-402-E	Bellevue Way	Main St to 108th Ave SE	Add a wide outside lane on the east side of Bellevue Way SE from Main Street to 108th Avenue SE where not complete.	Medium
Bicycle	B-402-W	Bellevue Way	Main St to 108th Ave SE	Add a wide outside lane on the west side of Bellevue Way SE from Main Street to 108th Avenue SE where not complete.	Medium
Bicycle	B-403-N	SE 22nd St	145th Pl SE to 156th Ave SE	Widen the existing 11 foot-wide lane to 14 feet (without fog line) on the north side of SE 22nd Street from 145th Place SE to 156th Avenue SE.	Medium
Bicycle	B-403-S	SE 22nd St	145th Pl SE to 156th Ave SE	Widen the existing 11 foot-wide lane to 14 feet (without fog line) on the south side of SE 22nd Street from 145th Place SE to 156th Avenue SE.	Medium
Bicycle	B-102-E	NE 36th Pl/115th Ave NE	113th Ave NE to 116th Ave NE	Add a 5 foot-wide bike lane on the east side of NE 36th Place and 115th Avenue NE from 113th Avenue NE to 116th Avenue NE.	Low
Bicycle	B-102-W	NE 36th Pl/115th Ave NE	113th Ave NE to 116th Ave NE	Add a 5 foot-wide bike lane on the west side of NE 36th Place and 115th Avenue NE from 113th Avenue NE to 116th Avenue NE.	Low
Bicycle	B-103-E	Bellevue Way	NE 24th St to 103rd Ave NE	Add a 5 foot bike lane on the east side of Bellevue Way from NE 24th Street to 103rd Avenue NE.	Low
Bicycle	B-103-W	Bellevue Way	NE 24th St to 103rd Ave NE	Add a 5 foot bike lane on the west side of Bellevue Way from NE 24th Street to 103rd Avenue NE.	Low
Bicycle	B-107-N	NE 24th St	98th Ave NE to 100th Ave NE	Add a 5 foot-wide bike lane on the north side of NE 24th Street from 98th Avenue NE to 100th Avenue NE.	Low
Bicycle	B-130-N	NE 4th Street extension	120th Ave NE to 116th Ave NE	Add a 5 foot-wide bike lanes on the north side of the NE 4th Street extension from 120th Avenue NE to 116th Avenue NE.	Low
Bicycle	B-130-S	NE 4th Street extension	120th Ave NE to 116th Ave NE	Add a 5 foot-wide bike lanes on the south side of the NE 4th Street extension from 120th Avenue NE to 116th Avenue NE.	Low
Bicycle	B-131-E	132nd Ave NE	Bel-Red Rd to NE 8th St	Add a 5 foot-wide bike lane on the east side of 132nd Avenue NE from Bel-Red Road to NE 8th Street.	Low
Bicycle	B-131-W	132nd Ave NE	Bel-Red Rd to NE 8th St	Add a 5 foot-wide bike lane on the west side of 132nd Avenue NE from Bel-Red Road to NE 8th Street.	Low
Bicycle	B-132-N	Main St	156th Ave NE to 158th Pl NE	Add a 5 foot-wide bike lane on the north side of Main Street from 156th Avenue NE to 158th Place NE.	Low
Bicycle	B-136-N	SE 7th Pl	Lake Hills Connector to east edge of Wilburton Hill Community Park	Add a 5 foot-wide bike lane on the north side of SE 7th Place from Lake Hills Connector to the east edge of Wilburton Hill Community Park.	Low
Bicycle	B-136-S	SE 7th Pl	Lake Hills Connector to east edge of Wilburton Hill Community Park	Add a 5 foot-wide bike lane on the south side of SE 7th Place from Lake Hills Connector to the east edge of Wilburton Hill Community Park.	Low
Bicycle	B-139-N	Kamber Road (SE 26th St)	Richards Rd (132nd Ave SE) to 145th Pl SE	Add 5 foot-wide bike lanes on the north side of Kamber Road (SE 26th Street) between Richards Road (132nd Avenue SE) to 145th Place SE.	Low
Bicycle	B-139-S	Kamber Road (SE 26th St)	Richards Rd (132nd Ave SE) to 145th Pl SE	Add 5 foot-wide bike lanes on the south side of Kamber Road (SE 26th Street) between Richards Road (132nd Avenue SE) to 145th Place SE.	Low
Bicycle	B-148-N	Phillips Hill Rd/164th Pl SE/SE 38th St	Eastgate Way to West Lake Sammamish Pkwy	Add a 5 foot-wide bike lane on the north side of SE 38th Street, 164th Place SE, and Phillips Hill Road from Eastgate Way to West Lake Sammamish Parkway SE.	Low
Bicycle	B-148-S	Phillips Hill Rd/164th Pl SE/SE 38th St	Eastgate Way to West Lake Sammamish Pkwy	Add a 5 foot-wide bike lane on the south side of SE 38th Street, 164th Place SE, and Phillips Hill Road from Eastgate Way to West Lake Sammamish Parkway SE.	Low
Bicycle	B-154-E	119th Ave SE	Coal Creek Pkwy to SE 60th St	Add a 5 foot-wide bike lane on the east side of 119th Avenue SE from Coal Creak Parkway to SE 60th Street.	Low
Bicycle	B-154-W	119th Ave SE	Coal Creek Pkwy to SE 60th St	Add a 5 foot-wide bike lane on the west side of 119th Avenue SE from Coal Creak Parkway to SE 60th Street.	Low
Bicycle	B-200-S	NE 24th St	98th Ave NE to Bellevue Way NE	Add a wide bike shoulder on the south side of NE 24th Street from 98th Avenue NE to Bellevue Way NE where not complete.	Low
Bicycle	B-211-E	101 Ave SE to 100th Ave SE to 98th Ave SE to SE 97th Pl	Main St to SE 16th St	Provide bike shoulders on 101 Avenue SE - 100th Avenue SE - 98th Avenue SE - SE 97th Place from Main Street to SE 16th Street when overlayed if feasible, particularly on uphill lanes; implement slow street design that accommodates bicycles.	Low

Continued on following page

Continued from previous page

Type	Project #	Link	Limits	Description	Priority
Bicycle	B-211-W	101 Ave SE to 100th Ave SE to 98th Ave SE to SE 97th Pl	Main St to SE 16th St	Provide bike shoulders on 101 Avenue SE - 100th Avenue SE - 98th Avenue SE - SE 97th Place from Main Street to SE 16th Street when overlayed if feasible, particularly on uphill lanes; implement slow street design that accommodates bicycles.	Low
Bicycle	B-215-E	112th Ave SE/SE 34th St	Bellevue Way SE (Mercer Slough Nature Park) to 108th Ave SE	Add a wide bike shoulder on the east side of 112th Avenue SE and SE 34th Street from SE Bellevue Way SE (Mercer Slough Nature Park) to 108th Avenue SE.	Low
Bicycle	B-215-W	112th Ave SE/SE 34th St	Bellevue Way SE (Mercer Slough Nature Park) to 108th Ave SE	Add a wide bike shoulder on the west side of 112th Avenue SE and SE 34th Street from SE Bellevue Way SE (Mercer Slough Nature Park) to 108th Avenue SE.	Low
Bicycle	B-216-E	156th Ave SE	SE 27th St to SE Eastgate Way	Add a wide bike shoulder on the east side of 156th Avenue SE from SE 27th Street to SE Eastgate Way.	Low
Bicycle	B-216-W	156th Ave SE	SE 27th St to SE Eastgate Way	Add a wide bike shoulder on the west side of 156th Avenue SE from SE 27th Street to SE Eastgate Way.	Low
Bicycle	B-219-N	SE 56th St	119th Ave SE to 128th Ave SE	Add a wide bike shoulder the north side of SE 56th Street and 119th Avenue SE to 128th Avenue SE where not complete.	Low
Bicycle	B-219-S	SE 56th St	119th Ave SE to 128th Ave SE	Add a wide bike shoulder on the south side of SE 56th Street and 119th Avenue SE to 128th Avenue SE where not complete.	Low
Bicycle	B-303-N	SE Allen Rd	139th Ave SE to SE 40th St	Add a shared shoulder on the north side of SE Allen Road from 139th Avenue SE to SE 40th Street.	Low
Bicycle	B-400-N	NE 24th St	140th Ave NE to 148th Ave NE	Add a wide outside lane on the north side of NE 24th Street from 140th Avenue NE to 148th Avenue NE where not complete.	Low
Bicycle	B-500-E	130th Ave NE	NE 16th St to Bel-Red Rd	Add a shared wide outside lane on the east side of 130th Avenue NE from NE 16th Street to Bel-Red Road.	Low
Bicycle	B-500-W	130th Ave NE	NE 16th St to Bel-Red Rd	Add a shared wide outside lane on the west side of 130th Avenue NE from NE 16th Street to Bel-Red Road.	Low

Appendix Table 3 Transit priority offstreet path projects.

Type	Project #	Link	Limits	Description	Priority
Offstreet Path	O-100-S	SR520 / NE Points Dr	Bellevue Way Interchange area to Bellevue Way	Add a 10-14 foot-wide off street path along the south side of NE Points Drive from the western part of the interchange area to the south side of Northup Way just east of the interchange. Component of priority bike corridor; EW-1: SR-520 Trail.	High
Offstreet Path	O-101	SR520 / NE Points Dr	Bellevue Way Interchange area (just north of SR-520) to Bellevue Way	Add a 10-14 foot-wide off street path along SR-520 connecting NE Points Drive to Northup Way over the Bellevue Way Interchange area (just north of SR-520). Component of priority bike corridor; EW-1: SR-520 Trail.	High
Offstreet Path	O-103	SR-520 Regional Trail	Evergreen Point Bridge to 124th Ave NE	Construct 10-14 foot-wide path from Bellevue Way/Evergreen Point Bridge to the west terminus of existing SR-520 trail at 124th Avenue NE. This facility extends east of Bellevue Way along the south side of Northup Way to 108th Avenue NE; along the east side of 108th Avenue NE; continuing east along the north side of SR-520 and eventually leading back to the proposed BNSF regional trail. East of the BNSF regional trail, completing the connection along the north side of SR-520 and south side of NE 24th Street to the existing trail system. Component of priority bike corridor; EW-1: SR-520 Trail.	High
Offstreet Path	O-115	Crossroads E-W Connection	156th Ave NE to 164th Ave NE	Add a 10-14 foot-wide off street path south of Highland Middle School connecting 148th Avenue NE to 156th Avenue NE, called the Crossroads east-west Connection.	High
Offstreet Path	O-116	trail	159th Ave NE to Crossroads Park and Community Center	Add a 10-14 foot-wide off street path connecting 159th Avenue NE and Northup Way to Crossroads Park and Community Center.	High
Offstreet Path	O-121-S	Main St	Bellevue Way NE to 116th Ave NE	Add a 10 to 14 foot wide off street path on the south side of Main Street from Bellevue Way NE to 116th Avenue NE. Component of priority bike corridor; EW-3: Lake to Lake Trail.	High
Offstreet Path	O-123-N	Lake Hills Connector	Main St to 140th Ave SE	Add a 10-14 foot-wide off street path on the north side of Lake Hills Connector from Main Street to 140th Avenue SE. Component of priority bike corridor; EW-3: Lake to Lake Trail.	High
Offstreet Path	O-124-S	Main St	NE 1st St to 124th Ave NE	Add a 10-14 foot-wide off street path on the south side of Main Street from NE 1st Street to 124th Avenue NE where not complete.	High
Offstreet Path	O-127-S	SE 8th St	114th Ave SE to Lake Hills Connector	Add a 10-14 foot-wide off street path on the south side of SE 8th Street from 114th Avenue SE to Lake Hills Connector. Component of priority bike corridor; EW-3: Lake to Lake Trail.	High
Offstreet Path	O-128-S	SE 7th Pl	Edge of Wilburton Hill Community Park to 128th Ave SE	Add a 10-14 foot-wide off street path on the south side of SE 7th Place from edge of Wilburton Hill Community Park to 128th Avenue SE.	High
Offstreet Path	O-130-S	SE 8th St	112th Ave SE to 114th Ave SE	Add a 10-14 foot-wide off street path on the south side of SE 8th Street from 114th Avenue SE to 112th Avenue SE.	High
Offstreet Path	O-102-E	Bellevue Way	Northup Way to 103rd Ave NE	Add a 10-14 foot-wide off street path along the east side of Bellevue Way from 103rd Avenue NE to Northup Way.	Medium
Offstreet Path	O-104	Burlington Northern Bike Path	southern city limits to northern city limits	Add a 10-14 foot-wide off-street path along the Burlington Northern Santa Fe railroad right-of-way from the southern city limits to the northern city limits. This is part of a proposed regional trail that would connect eastside communities from Renton to Woodinville. Approximately 7.5 miles of the trail is located within the City of Bellevue. The regional trail shall have connections to pedestrian and non-motorized city facilities and be compliant with current trail standards. Potential trail connections include Newcastle Beach Park, Greenwich Crest, the I-90 trail, Woodridge, the Wilburton area, downtown Bellevue, Bel-Red, NE 15th St, the West Tributary Trail and the SR 520 trail. Identified as priority bike corridor NS-3: BNSF Trail Corridor.	Medium
Offstreet Path	O-108-N	NE 12th St	100th Ave NE to 116th Ave NE	Add a 10 to 14 foot wide off-street path on the north side of NE 12th Street from 100th Avenue NE to 116th Avenue NE. Component of priority bike corridor; EW-2: Downtown-Overlake Connection.	Medium
Offstreet Path	O-110-N	NE 16th St	116th Ave NE to 140th Ave NE	Add 10-14 foot-wide off street path along the north side of NE 16th Street from 116th Avenue NE to 140th Avenue NE. Component of priority bike corridor; EW-2: Downtown-Overlake Connection.	Medium
Offstreet Path	O-114	trail	Highland Middle School to NE 8th St	Add a 10-14 foot-wide off street path connecting Highland Middle School to NE 8th Street.	Medium
Offstreet Path	O-117	NE 6th St (ped corridor)	Bellevue Way to 110th Ave NE	Construct NE 6th Street "Pedestrian Corridor" between Bellevue Way and 110th Avenue NE consistent with design guidelines; pursue interim improvements (ahead of full redevelopment) where appropriate.	Medium
Offstreet Path	O-118-S	NE 6th St extension	112th Ave NE to 120th Ave NE	Add a 10-14 foot wide off street path along the south side of the NE 6th Street extension, across I-405, from 112th Avenue NE to 120th Avenue NE.	Medium
Offstreet Path	O-131-E	112th Ave SE/Bellevue Way SE	SE 8th St to I-90 trail	Add a 10-14 foot-wide off street path on the east side of 112th Avenue SE and Bellevue Way SE from SE 8th Street to 113th Avenue SE (I-90 trail).	Medium
Offstreet Path	O-132-N	BCC Thruway	142nd Pl SE to 144th Ave SE	Add a 10-14 foot-wide off street path along the north side of the BCC Thruway from 142nd Place SE to 144th Avenue SE.	Medium
Offstreet Path	O-134	161st Ave SE across Landfill Park Site	156th Ave SE to SE Eastgate Way	Add a 10-14 foot-wide off street path on along 161st Avenue SE from 156th Avenue SE to SE Eastgate Way. Component of priority bike corridor; NS-5: Spirit Ridge-Sammamish River Connection.	Medium
Offstreet Path	O-135-S	I-90 Tunnel	SE37th St to SE Eastgate Way	Increase sidewalk width on south side of I-90 tunnel to 10 feet to offer cyclists improved accommodation from SE 37th Street. under I-90 to Eastgate Way/SE 35th Place intersection. Coordinate with WSDOT to improve lighting within the tunnel. Improve signing to the tunnel to increase awareness of cyclists. Component of priority bike corridor; NS-5: Spirit Ridge-Sammamish River Connection.	Medium
Offstreet Path	O-137-N	Mountains to Sound Greenway	Factoria Blvd to Sunset Pedestrian Bridge	A paved multiuse trail of 10 feet or greater paved width is proposed beginning at the current end of the trail at Factoria Blvd and running eastward along the north side of SE 36th St to the curve near the southwest quadrant's ramps of the 148th-150th Ave SE interchange, then following a new independent alignment to the 150th Avenue SE/SE 37th St intersection at 150th Ave SE. Eastward from 150th Ave SE the trail would follow SE 37th St (which here serves as an I-90 frontage road) to the Sunset Pedestrian Bridge where cyclists will cross to the north side of I-90 and make use of the Sunset Trail to WLSP. Construction of the recommended MTSG I-90 trail links such as the segment along SE 36th St should not eliminate existing on-street bicycle facilities; the latter should be maintained, and improved where improvement is needed, such as in the vicinity of the 148th-150th Ave interchange as SE 36th St curves to become SE 37th St. Additional coordination between City of Bellevue, WSDOT, King County, and Greenway Trust required to study this route. Identified as priority bike corridor EW-4.	Medium
Offstreet Path	O-139-W	Coal Creek Pkwy	124th Ave SE to the southern city limits	Add a 10-14 foot-wide off street path along the west side of Coal Creek Parkway from 124th Avenue SE to the southern city limits. Component of priority bike corridor; EW-5: Coal Creek-Cougar Mountain Connection.	Medium

Continued on following page

Continued from previous page

Type	Project #	Link	Limits	Description	Priority
Offstreet Path	O-109	West Tributary Trail	BNSF Corridor to Bel-Red Rd	Add a 10-14 foot-wide off street path along the West Tributary of Kelsey Creek between the BNSF Corridor and Bel-Red Road. Provide grade separation of this trail at arterial crossings.	Low
Offstreet Path	O-111-E	132nd Ave NE	NE 20th St to Bel-Red Rd	Add a 10-14 foot-wide off street path on the east side of 132nd Avenue NE from NE 20th Street to Bel-Red Road.	Low
Offstreet Path	O-112	East Highland/ Rockwood	140th Ave NE to 141st Pl NE	Add a 10-14 foot-wide off street path connecting Rockwood/East Highland from 140th Avenue NE to 141st Place NE.	Low
Offstreet Path	O-113	trail	148th Ave NE to 156th Ave NE	Add a 10-14 foot-wide off street path south of Highland Middle School connecting 148th Avenue NE to 156th Avenue NE.	Low
Offstreet Path	O-119	Bel-Red Mini Park	Bel-Red Rd at 122nd Ave (alignment) to Bel-Red Rd at 124th Ave NE	Add a 10-14 foot-wide off street path through the Bel-Red Mini Park from Bel-Red Road at 112nd Avenue (alignment) to Bel-Red Road at 124th Avenue NE.	Low
Offstreet Path	O-122	Main St extension	116th Ave NE to BNSF	Add a 10-14 foot wide off street path along the Main St extension from 116th Avenue NE to the BNSF corridor.	Low
Offstreet Path	O-125	Existing BBG/Wilburton Hill Trails	118th Ave SE to SE 4th Pl	Add a 10-14 foot wide off street path along the existing trails through the Bellevue Botanical Garden and Wilburton Hill Community Park from approximately 118th Avenue SE in the BBG to SE 4th Place outside of Wilburton Hill Community Park.	Low
Offstreet Path	O-133	Robinswood to Eastgate	SE 28th St to Eastgate Way	Add a 10-14 foot-wide off street path along the connection from Robinswood to Eastgate from SE 28th Street to SE Eastgate Way.	Low
Offstreet Path	O-138	156th Ave SE	SE 37th St to intersection with east/ west portion of B-256	Add a 10-14 foot-wide off street path along 156th Avenue SE from SE 38th Street to the intersection where it connects with project B-256. Improve ROW to create connection.	Low
Offstreet Path	O-142	Pipeline Trail	SE 60th St to SE 68th Pl	Add a 10-14 foot-wide off street path along the Pipeline Trail from SE 60th Street to SE 68th Place.	Low
Offstreet Path	O-300	Northtowne Center Trail	106th Ave NE to Bellevue Way via shopping center	Add a 6 foot-wide off street path as a connection thru the shopping center site, extending the existing neighborhood-shopping center trail to Bellevue Way and Northtowne Park. Obtain easement and maintain existing trail to shopping center .	Low
Offstreet Path	O-302	NE 28th St	Bel-Red Road to NE 28th St and MS Campus	Add a 6 foot-wide off street path along NE 28th Street right-of-way from Bel-Red Road to NE 28th Street and MS Campus.	Low
Offstreet Path	P-1	SE 32nd St	148th St SE to Eastgate Park-and-Ride	A new east-west pedestrian connection is formalized through the Lincoln Executive Center to the Eastgate Park-and-Ride.	N/A

Appendix Table 4 Transit priority trail projects.

Type	Project #	Link	Limits	Description	Priority
Trail	P-2	SE 33rd St	156th Ave SE to 158th Ave SE	Improve east-west pedestrian and bicycle connectivity to retail services by creating a 6 to 10' wide trail connection that links SE 33rd Street to 156th Avenue SE.	N/A
Trail	T-202	Rockwood to Highland	NE 14th St to Bel-Red Rd	Construct 6-10 foot wide boardwalk along Rockwood to Highland from NE 14th Street to Bel-Red Road.	High
Trail	T-203	SE 10th St	Bellevue Way to 106th Ave NE	Add a 6-10 foot wide boardwalk along SE 10th Street from Bellevue Way to 106th Avenue NE.	High
Trail	T-204	Kelsey Creek Park	Kelsey Creek to Richards Valley	Add a 6-10 foot wide boardwalk through Kelsey Creek Park connecting Kelsey Creek to Richards Valley.	High
Trail	T-205	Richards Valley Nature Trail	Richards Valley open space to the Lake Hills Connector	Add a 6-10 foot wide boardwalk called Richards Valley Nature Trail connecting the Richards Valley open space to Lake Hills Connector.	High
Trail	T-206	128th Ave SE	SE 25th St SE to SE 32nd St SE	Construct 6-10 foot wide boardwalk along 128th Avenue SE from SE 25th Street SE to SE 32nd Street SE.	High
Trail	T-207	SE 30th St	128th Ave SE to Richards Rd	Add a 6-10 foot wide boardwalk along 128th Avenue SE from SE 24th Street to SE 32nd Street .	High
Trail	T-208	Monthaven-Factoria Connector	132nd Ave SE @ Sunset Elementary School to 132nd Ave SE at Newport Office Pk; and to SE 38th St	Construct 6-10 foot wide boardwalk along the Monthaven-Factoria Connector from 132nd Ave SE @ Sunset Elementary School to 132nd Ave SE at Newport Office Pk; and to SE 38th Street.	High
Trail	T-209	SE 41st St	Factoria Blvd to 133rd Ave SE	Add a 6-10 foot wide boardwalk along SE 41st Street from Factoria Boulevard to 133rd Avenue SE.	High
Trail	T-302	136th Avenue Powerline Corridor	Bel-Red Rd to SE 3rd Pl	Add an 8-12 foot wide multiple use gravel trail called the 136th Avenue Powerline Corridor connecting Bel-Red Road to SE 3rd Place.	High
Trail	T-303	Bellefield Office Park	SE 8th St to SE 18th St alignment	Add an 8-12 foot wide multiple use gravel trail through the Bellefield Office Park connecting SE 8th Street to SE 18th Street alignment.	High
Trail	T-304	Lake Hills Connector	SE 8th St to Richards Road	Add an 8-12 foot wide multiple use gravel trail along Lake Hills Connector from SE 8th Street to Richards Road.	High
Trail	T-305	Richards Valley on SE 24th St	145th Pl SE to Kamber Rd	Add an 8-12 foot wide multiple use gravel trail through Richards Valley along SE 24th Street connecting 145th Place SE to Kamber Road.	High
Trail	T-306	Seattle Water Pipeline	Coal Creek Parkway to 128th Ave SE @ Newport Way	Add an 8-12 foot wide multiple use gravel trail called the Seattle Water Pipeline Trail from Coal Creek Parkway to 128th Avenue SE at Newport Way.	High
Trail	T-408	Unigard Trail System	Northup to NE 24th St E/O 156th Avenue NE	Add a 2-6 foot wide pedestrian walking trail within the Unigard Trail System connecting Northup Way to either NE 24th Street or 156th Avenue NE.	High
Trail	T-409	Hillaire to Crossroads	NE 6th Street to NE 8th Street	Add a 2-6 foot wide multiple use gravel trail from Hillaire to Crossroads connecting NE 6th Street to NE 8th Street.	High
Trail	T-410	Hillaire Access Trail	NE 4th Street to Hillaire Park	Add a 2-6 foot wide multiple use gravel trail called the Hillaire Access Trail connecting NE 4th Street to Hillaire Park.	High
Trail	T-415	Richards Valley Nature Trail	Richards Valley open space to Kamber Road	Add a 2-6 foot wide pedestrian walking trail called the Richards Valley Nature Trail connecting Richards Valley open space to Kamber Road.	High
Trail	T-423	Newport Creek	Coal Creek Parkway to 119th Ave SE at SE 56th St (swim club)	Add a 2-6 foot wide pedestrian walking trail along Newport Creek connecting Coal Creek Parkway to 119th Avenue SE at SE 56th Street (swim club).	High
Trail	T-100	Mercer Slough Park Trail	I-90 to 118th Ave SE	Add a 6-10 foot wide boardwalk called the Mercer Slough Park Trail connecting I-90 to 118th Avenue SE.	Medium
Trail	T-301	126th Ave NE	Wilburton Hill Park and NE 4th Pl	Add an 8-12 foot wide multiple use gravel trail called the 126th Avenue NE Trail connecting Wilburton Hill Park and NE 4th Place.	Medium
Trail	T-401	NE 28th St ROW Trail	116th Ave NE to 120th Ave NE	Add a 2-6 foot wide pedestrian walking trail called the NE 28th Street ROW Trail connecting 116th Avenue NE to 120th Avenue NE.	Medium
Trail	T-413	Woodridge to Lk Hills Connect	Woodridge Div 9 to Lake Hills Connector	Add a 2-6 foot wide multiple use gravel trail that connects Woodridge Div 9 to Lake Hills Connector.	Medium
Trail	T-418	Vasa Creek System	Newport Way to I-90	Add a 2-6 foot wide pedestrian walking trail within the Vasa Creek System connecting Newport Way and I-90.	Medium
Trail	T-421	Park & Ride Connection	I-405 Park & Ride to SE 60th St	Add a 2-6 foot wide pedestrian walking trail called the Park & Ride Connection connecting I-405 Park & Ride to SE 60th Street.	Medium
Trail	T-424	123rd Ave SE Connection	123rd Ave SE to Coal Creek Parkway	Add a 2-6 foot wide pedestrian walking trail called the 123rd Avenue SE Connection connecting 123rd Avenue SE to Coal Creek Parkway.	Medium
Trail	T-200	35th PL NE	Western City Limits to 31st Pl NE	Add a 6-10 foot wide boardwalk along approximately 35th Place NE from the Western City Limits to 31st Place NE.	Low
Trail	T-308	SE 64th Pl	127th SE to 129th Ave SE	Add an 8-12 foot wide multiple use gravel trail along SE 64th Place from 127th Avenue SE to 129th Avenue SE.	Low
Trail	T-422	Newport Hills Connection	Park & Ride Connection to 116th Ave SE	Add a 2-6 foot wide pedestrian walking trail called the Eastside Catholic Connection connecting the Park & Ride to 116th Avenue SE.	Low

Appendix Table 5 Transit priority multimodal intersection improvement projects.

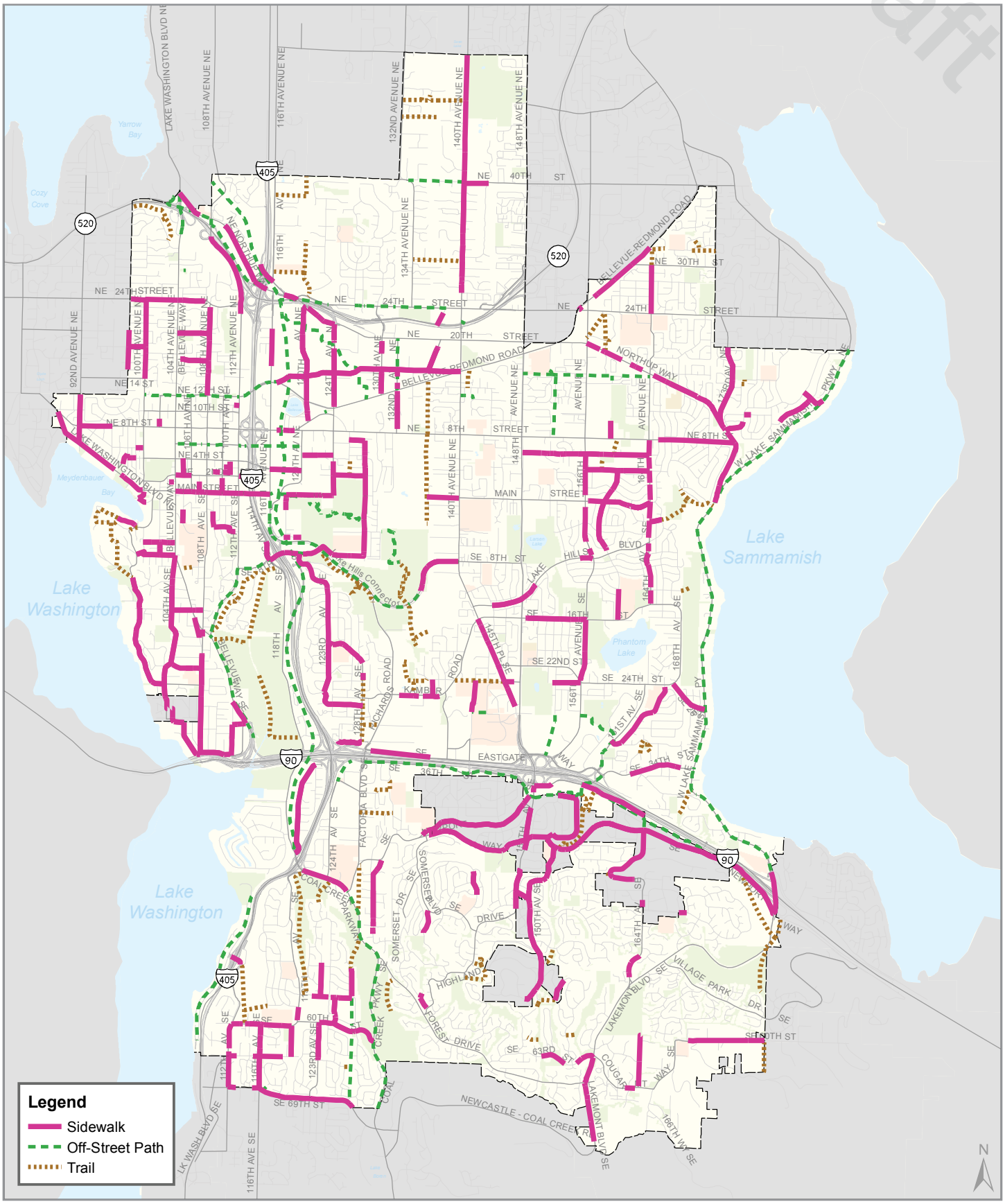
Type	Project #	Intersection	Description	Priority
Multimodal Intersection	I-1	Factoria Blvd / SE 36th St	Redesign the Factoria Blvd and SE 36th St intersection to enhance pedestrian and bicycle crossings.	N/A
Multimodal Intersection	I-2	150th Ave SE / SE Eastgate Way	Redesign 150th Ave SE and SE Eastgate Way intersection to enhance traffic flow, upgrade pedestrian and bicycle crossings, and establish a gateway treatment, potentially to include developing a modern roundabout.	N/A
Multimodal Intersection	I-3	156th Ave SE / SE Eastgate Way	Redesign 156th Ave SE and SE Eastgate Way intersection to enhance traffic flow, upgrade pedestrian and bicycle crossings, and establish a gateway treatment, potentially to include developing a modern roundabout.	N/A
Multimodal Intersection	I-4	150th Ave SE / I-90 Eastbound Off-Ramp	Redesign 150th Ave SE and I-90 Eastbound Off-Ramp (SE 37th St) intersection to enhance traffic flow, upgrade pedestrian and bicycle crossings, and establish a gateway treatment, potentially to include developing a modern roundabout.	N/A

Unfold for full sheet

APPENDIX B2: SOURCE DOCUMENT PROJECT MAPS

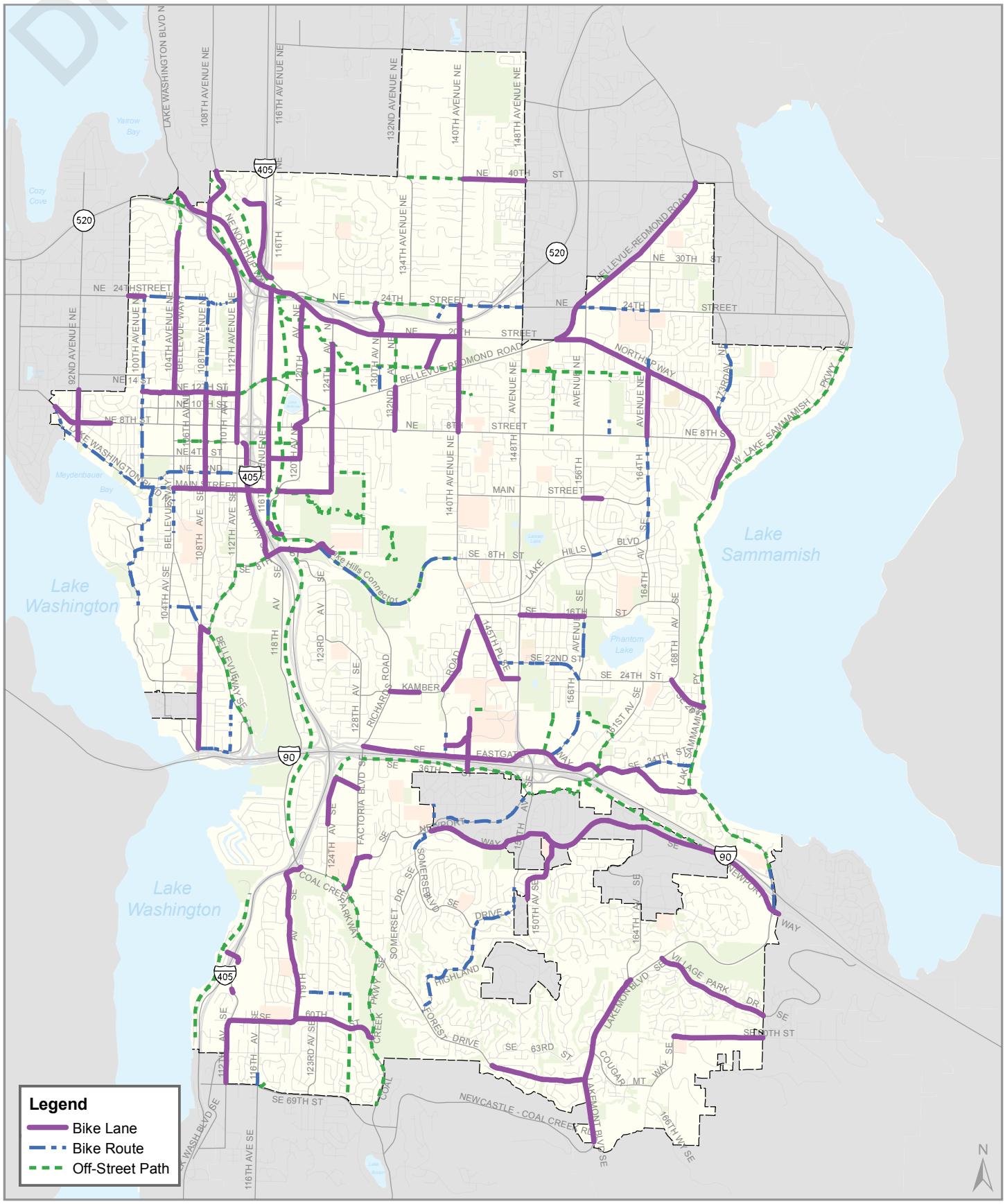
Draft

Appendix Figure 1 Map of pedestrian projects from the *2009 Pedestrian and Bicycle Transportation Plan Report* (p 105).

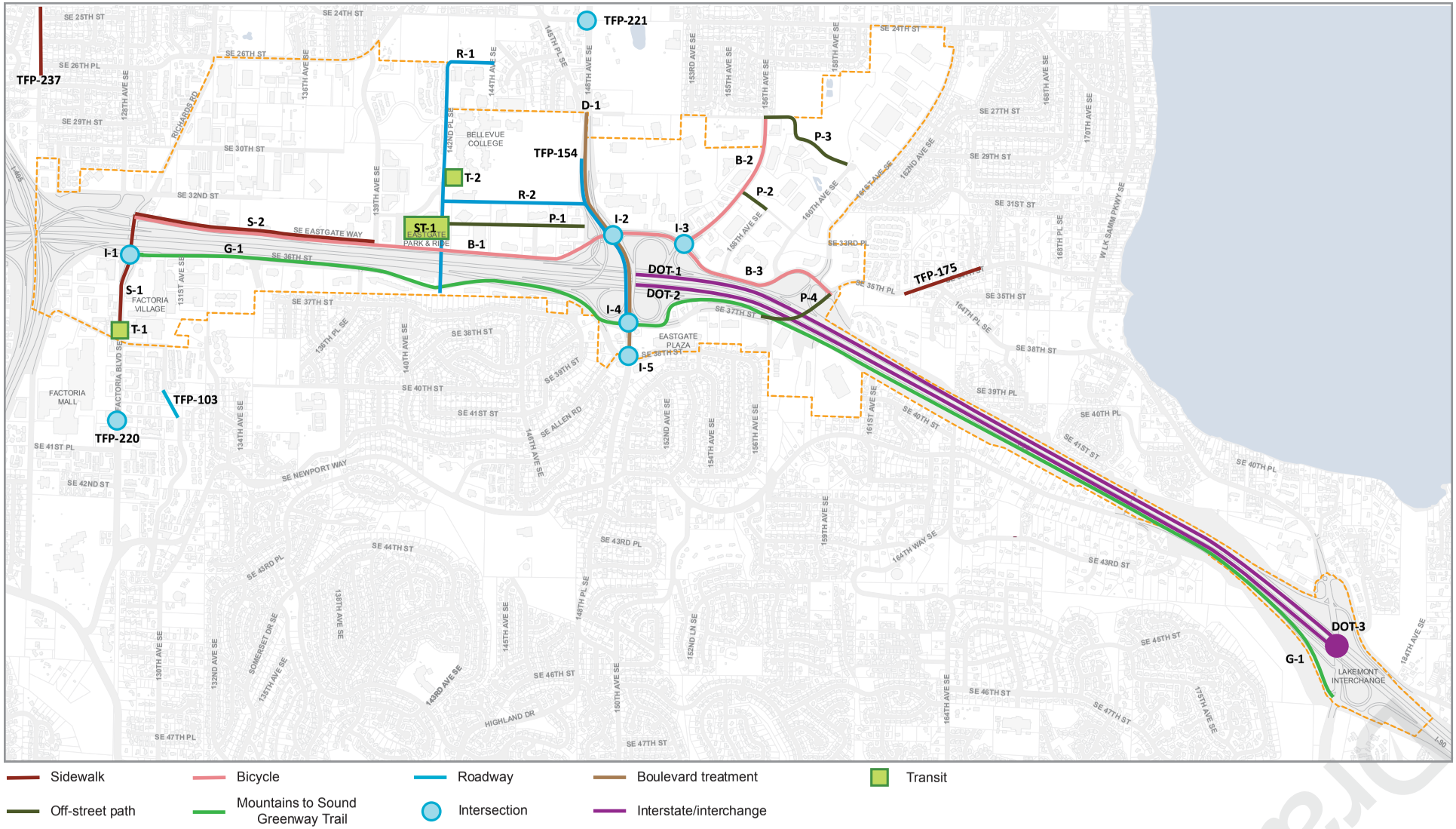


Draft

Appendix Figure 2 Map of bicycle projects from the *2009 Pedestrian and Bicycle Transportation Plan Report* (p 140).



Appendix Figure 3 Map of suggested transportation improvements from the *Eastgate/I-90 Transportation Strategies Report* (p 45).



Sidewalk
Bicycle
Roadway
Boulevard treatment
Transit
Off-street path
Mountains to Sound Greenway Trail
Intersection
Interstate/interchange

Draft

Draft

This page intentionally left blank.

APPENDIX C

APPENDIX C1: BUS SHELTER WARRANTS

Draft

Appendix Table 6 Bus stops without cover that meet King County Metro shelter warrants.

Bus Stop ID	On Street		Cross Street		Daily Boardings	Serves 2030 Growing Resources Network	
	Street	Side	Street	Side		FTN	Coverage
Highest Ridership | 91+ Daily Boardings							
85640	NE 4th St	North	108th Ave NE	West	240	Y	N
80400	Factoria Blvd SE	East	SE 40th Pl	North	168	Y	Y
High Ridership | 56–90 Daily Boardings							
69026	NE 10th St	South	110th Ave NE	West	90	Y	N
74460	108th Ave NE	West	Northup Way	North	83	Y	N
70607	NE 8th St	North	Bellevue Way NE	West	76	Y	Y
71300	NE 24th St	North	161st Ave NE	East	68	N	Y
64802	124th Ave SE	East	SE 44th St	North	63	Y	N
68594	145th Pl SE	East	SE 16th St	South	63	Y	N
67610	NE 8th St	North	108th Ave NE	West	62	Y	Y
68474	Main St	North	148th Ave NE	West	56	N	N
Medium Ridership | 40–54 Daily Boardings							
66700	NE 24th St	South	162nd Ave NE	East	54	N	Y
73055	116th Ave NE	East	NE 12th St	South	51	Y	Y
67580	NE 8th St	North	120th Ave NE	East	49	Y	N
70806	140th Ave SE	West	SE 5th St	South	46	Y	N
72940	NE 8th St	North	92nd Ave NE	East	46	N	Y
68420	156th Ave NE	West	NE 15th Pl	South	43	Y	N
68611	145th Pl SE	West	Lake Hills Blvd	South	41	Y	N
85725	NE 4th St	South	108th Ave NE	East	40	N	N
Lower Ridership | 25–39 Daily Boardings							
80570	116th Ave SE	East	SE 1st St	North	39	Y	N
81633	Northup Way	North	130th Ave NE	West	38	N	Y
68788	156th Ave NE	East	NE 24th St	North	37	Y	Y
74442	108th Ave NE	West	NE 38th Pl	North	37	Y	N
67595	NE 10th St	South	116th Ave NE	West	36	Y	N
68700	156th Ave NE	East	Main St	North	36	Y	N
69028	NE 10th St	North	116th Ave NE	West	36	Y	N
70828	140th Ave SE	East	SE 5th St	South	36	Y	N
68593	145th Pl SE	West	SE 16th St	South	33	Y	N
68680	156th Ave SE	East	Lake Hills Blvd	North	32	Y	N

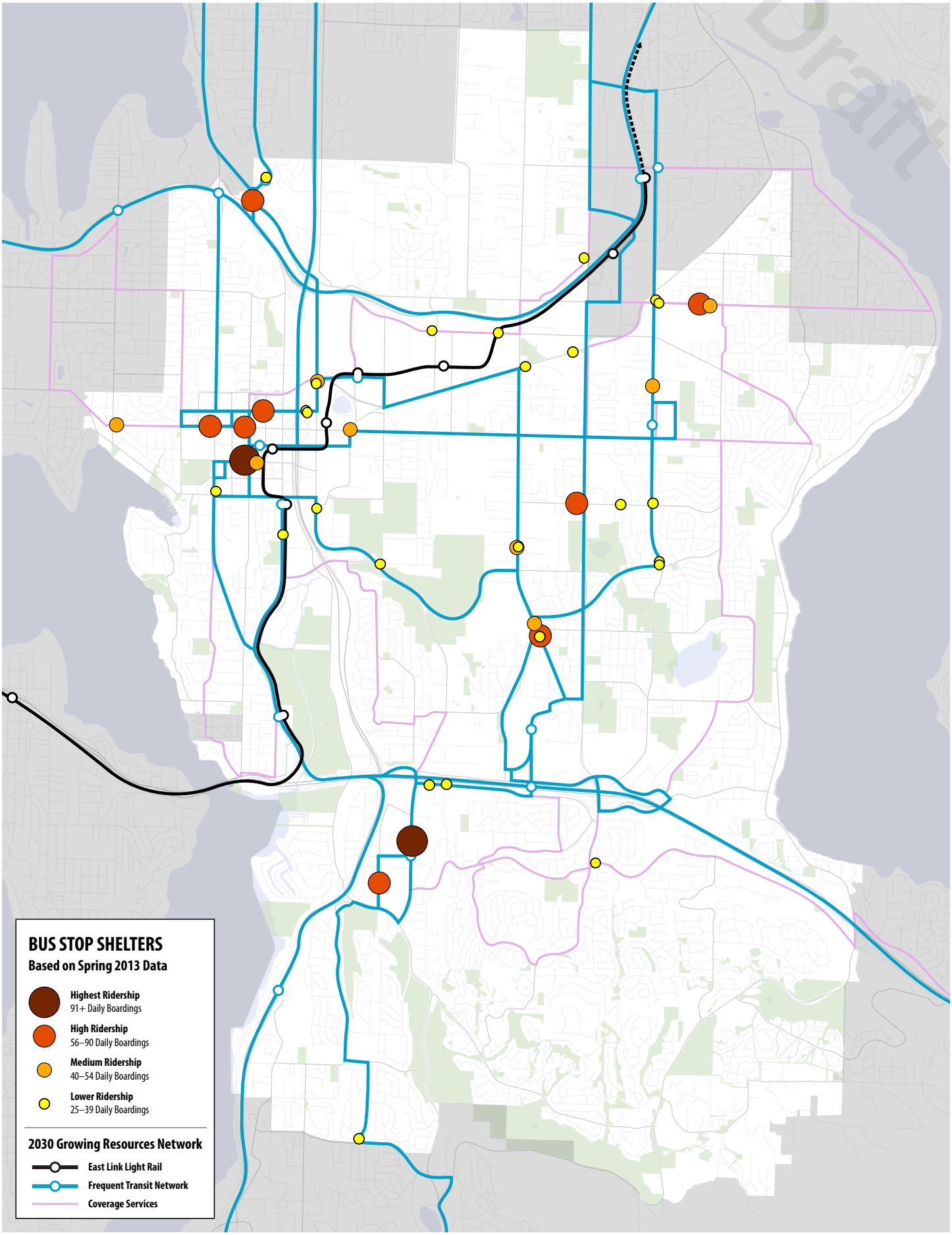
Continued on following page

Continued from previous page

Bus Stop ID	On Street		Cross Street		Daily Boardings	Serves 2030 Growing Resources Network	
	Street	Side	Street	Side		FTN	Coverage
84825	NE Bellevue Redmond Rd	North	148th Ave NE	West	32	N	N
68370	NE 24th St	South	156th Ave NE	East	31	N	Y
68068	NE Bellevue Redmond Rd	South	140th Ave NE	East	30	N	N
67032	SE 36th St	North	132nd Ave SE	East	29	Y	N
68472	Main St	North	152nd Pl SE	West	29	N	N
70807	Lake Hills Connector	East	SE 8th St	East	29	Y	N
74537	NE 20th St	North	136th Pl NE	East	29	N	Y
79862	SE 36th St	South	131st Ave SE	West	28	Y	N
82790	112th Ave SE	East	SE 4th St	North	28	Y	Y
68035	Bellevue Way NE	East	Main St	North	27	Y	N
68502	156th Ave SE	West	Lake Hills Blvd	North	27	Y	N
64670	SE Newport Way	North	151st Ave SE	East	26	N	Y
65432	123rd Ave SE	East	SE 68th Pl	N/A	26	Y	N
68353	116th Ave NE	West	NE 12th St	South	26	Y	N
73284	NE 29th Pl	West	148th Ave NE	South	26	N	Y

Draft

Appendix Figure 4 Bus stops without cover that meet King County Metro shelter warrants.



APPENDIX C2: COMMUTER PARKING ANALYSIS DATA

Draft

Appendix Table 7 Historic utilization of park-and-ride lots for the I-405 and I-90 corridors.

	2000	2008	2009	2010	2011	2012	2013
I-90 Corridor Park-and-Rides	1,950	3,442	3,660	3,830	4,044	4,314	4,447
I-405 Corridor Park-and-Rides	3,425	3,660	3,627	3,956	4,162	4,109	4,332
Total Park-and-Ride Spaces Used Daily	5,375	7,102	7,287	7,786	8,206	8,423	8,779

Appendix Table 8 Constrained and unconstrained demand for park-and-ride lots along the I-90 corridor.

	2013	2030
Constrained Model	4,236	5,838
Unconstrained Model	4,236	11,901

Appendix Table 9 Constrained and unconstrained demand for park-and-ride lots along the I-405 corridor.

	2013	2030
Constrained Model	3,977	5,516
Unconstrained Model	3,977	9,914

Appendix Table 10 Distances traveled by users to reach the South Bellevue Park-and-Ride.

Place of Residence	
Survey Date: August 2013	
Park-and-Ride Capacity	519
# of Washington registered vehicles	517
< 1 mile	28
1-2 miles	54
2-3 miles	84
3-4 miles	58
4-5 miles	48
> 5 miles	212
Total	484

Note: Of the 517 Washington-registered vehicles, 6% could not be geocoded.

Appendix Table 11 Distances traveled by users to reach the Eastgate Park-and-Ride.

Place of Residence	
Survey Date: August 2013	
Park-and-Ride Capacity	1,614
# of Washington registered vehicles	1,078
< 1 mile	116
1-2 miles	309
2-3 miles	255
3-4 miles	115
4-5 miles	41
> 5 miles	242
Total	1078

Note: Of the 1,078 Washington-registered vehicles, 4% could not be geocoded.

Draft

Appendix Table 12 Summary of parking demand and capacity for park-and-ride lots in 2013 and 2030.

Park-and-Ride Facility	BKR SAZ	2013 Capacity and Use[1]		Oversupply or Shortage in 2013	2030 Capacity and Demand[2]			Oversupply or Shortage in 2030	
		Lot Capacity	Use		Projected Capacity	Constrained Demand[3]	Unconstrained Demand[3,4]	Based on Constrained Demand	Based on Unconstrained Demand
I-90 Lots									
Mercer Island	681	447	447	0	498	520	888	-22	-390
South Bellevue	686	519	555	-36	1,400	1,461	4,291	-61	-2,891
Eastgate	688	1,614	1,452	162	1,614	1,686	4,457	-72	-2,843
Issaquah	680	819	776	43	1,016	1,061	1,504	-45	-488
Issaquah Highlands	779	1,010	968	42	1,010	1,055	719	-45	291
Preston	789	53	38	15	53	55	42	-2	11
Total		**4,462**	**4,236**	**226**	**5,591**	**5,838**	**11,901**	**-247**	**-6,310**
I-405 Lots									
Kenmore	703	603	601	2	618	642	1,227	-24	-609
Bothell	705	220	215	5	220	229	409	-9	-189
Woodinville	706	438	240	198	438	456	493	-18	-55
Brickyard	701	443	362	81	443	462	993	-19	-550
Kingsgate	700	502	507	-5	502	524	1,029	-22	-527
SR 908 / Kirkland Way	813	20	17	3	20	21	18	-1	2
Houghton	694	470	203	267	470	491	406	-21	64
Redmond	696	377	375	2	385	403	814	-18	-429
Bear Creek	699	283	308	-25	283	296	609	-13	-326
Evergreen Point	690	31	38	-7	51	53	26	-2	25
S Kirkland	692	783	304	479	727	760	1,756	-33	-1,029
NE 40th / Overlake TC	832	222	222	0	369	386	1,186	-17	-817
Overlake	693	203	76	127	203	212	546	-9	-343
Wilburton	687	186	143	43	186	194	303	-8	-117
Newport Hills	683	275	218	57	275	254	53	21	222
Renton	679	150	148	2	128	133	46	-5	82
Total		**5,206**	**3,977**	**1,229**	**5,318**	**5,516**	**9,914**	**-198**	**-4,596**

1. 2013 Capacity and Use are from the King County Metro Transit, Park-and-Ride Utilization Report, Third Quarter 2013.
2. Capacity and Demand figures for 2030 are projected from Bellevue's BKR model (MP30r6.2).
3. 2030 Demand assumes TMP "Growing Resources Scenario". Demand forecast is based on future service assumptions and BKR model transit ridership growth rates.
4. In addition to the above assumptions, the 2030 Unconstrained Demand places no limitations on the total number of parking stalls available.

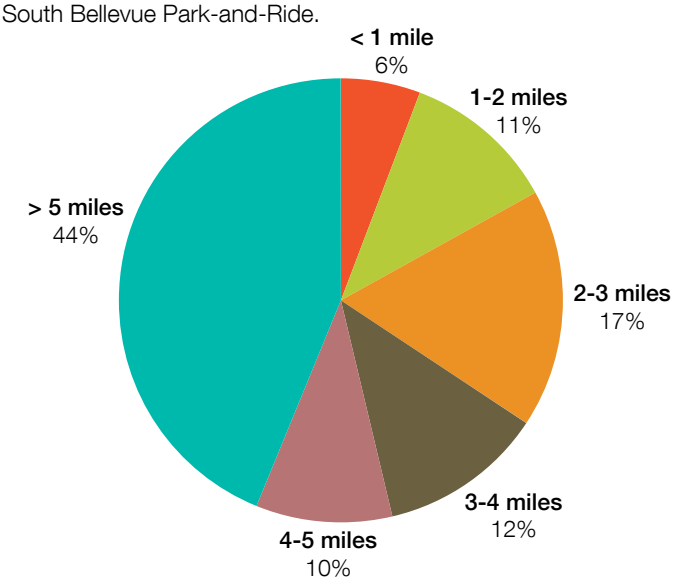
South Bellevue Park-and-Ride

Draft

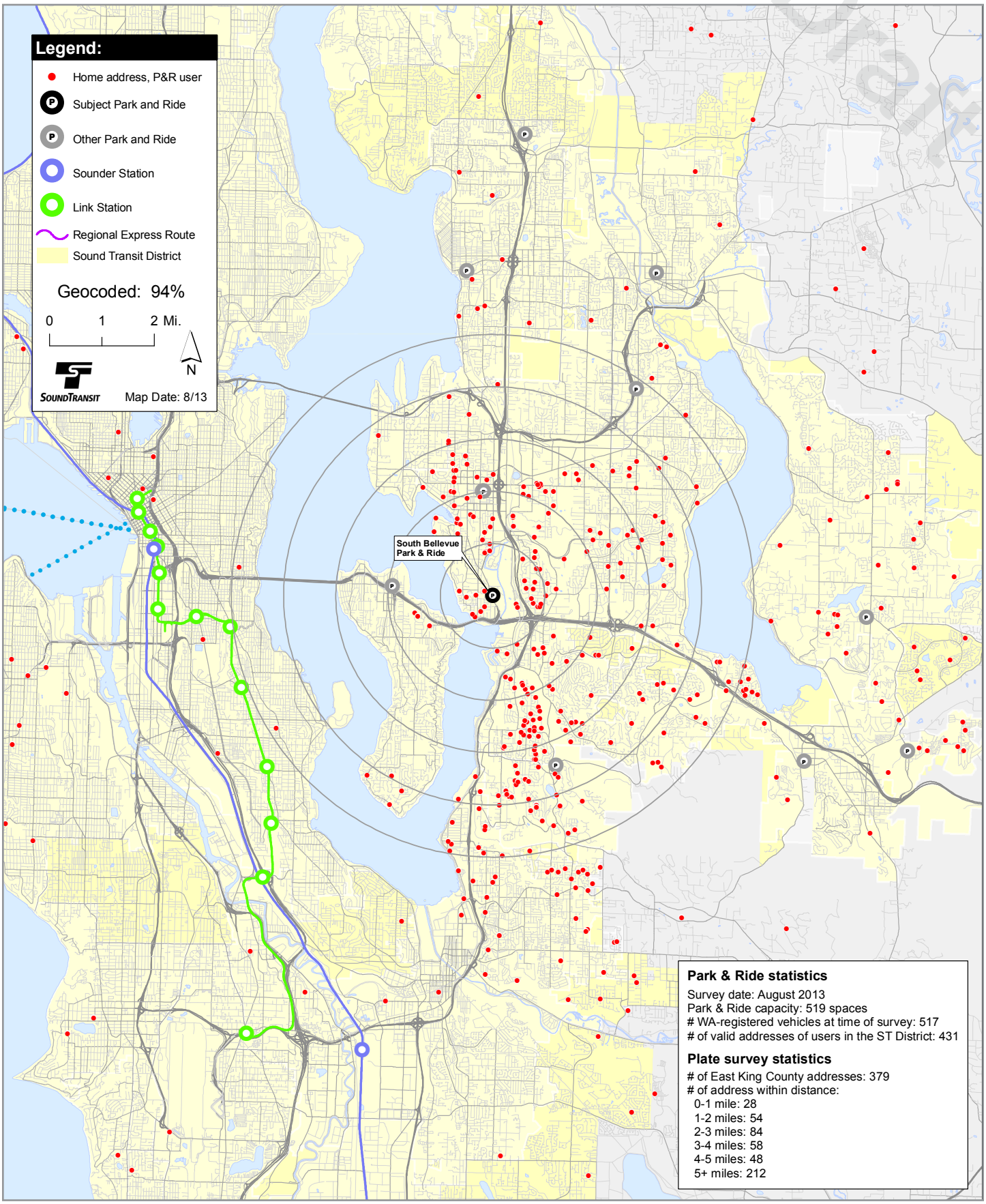
According to a license plate survey conducted by Sound Transit in August 2013, 58 percent of visitors to the South Bellevue Park-and-Ride commute from outside of the Bellevue city limits. Forty-four percent of the lot's demand is generated further than five miles from the lot. Demand calculations used in this survey were based on the total number of vehicles registered in Washington with addresses that are able to be recognized by Sound Transit's geographic information system (GIS), of which there were 484 vehicles.

The pie chart in Appendix Figure 5 shows the distribution of park-and-ride users with origins of less than five miles from the lot. Only 6 percent of South Bellevue Park-and-Ride users commute less than one mile, 78 percent of the demand is from East King County, and only about 7 percent of the demand comes from Seattle. Within East King County, the demand is generally evenly distributed, but south of Bellevue city limits, the I-5 corridor from the edge of Lake Washington to the east 2.5 miles contains 30 percent of all users, with origins from the two cities of Renton and Newcastle. The South Bellevue Park-and-Ride's market area, as determined by Sound Transit's license plate survey, is illustrated in Appendix Figure 6.

Appendix Figure 5 Distances traveled by users to reach the South Bellevue Park-and-Ride.



Appendix Figure 6 Origins of South Bellevue Park-and-Ride users, August 2013.



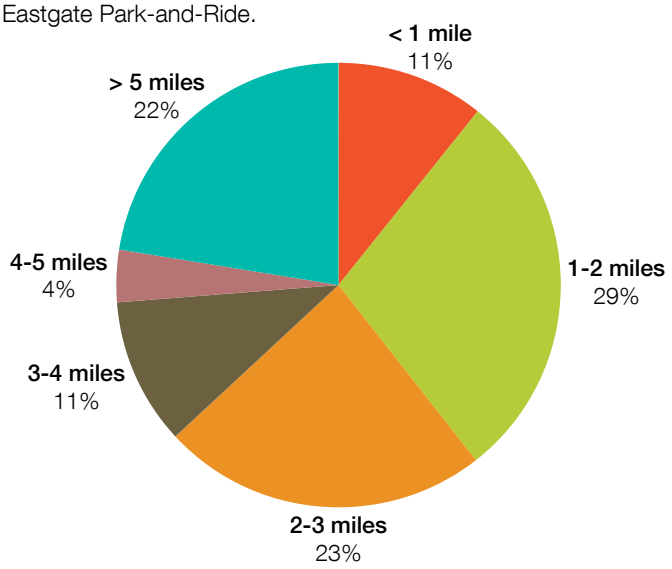
Eastgate Park-and-Ride

Draft

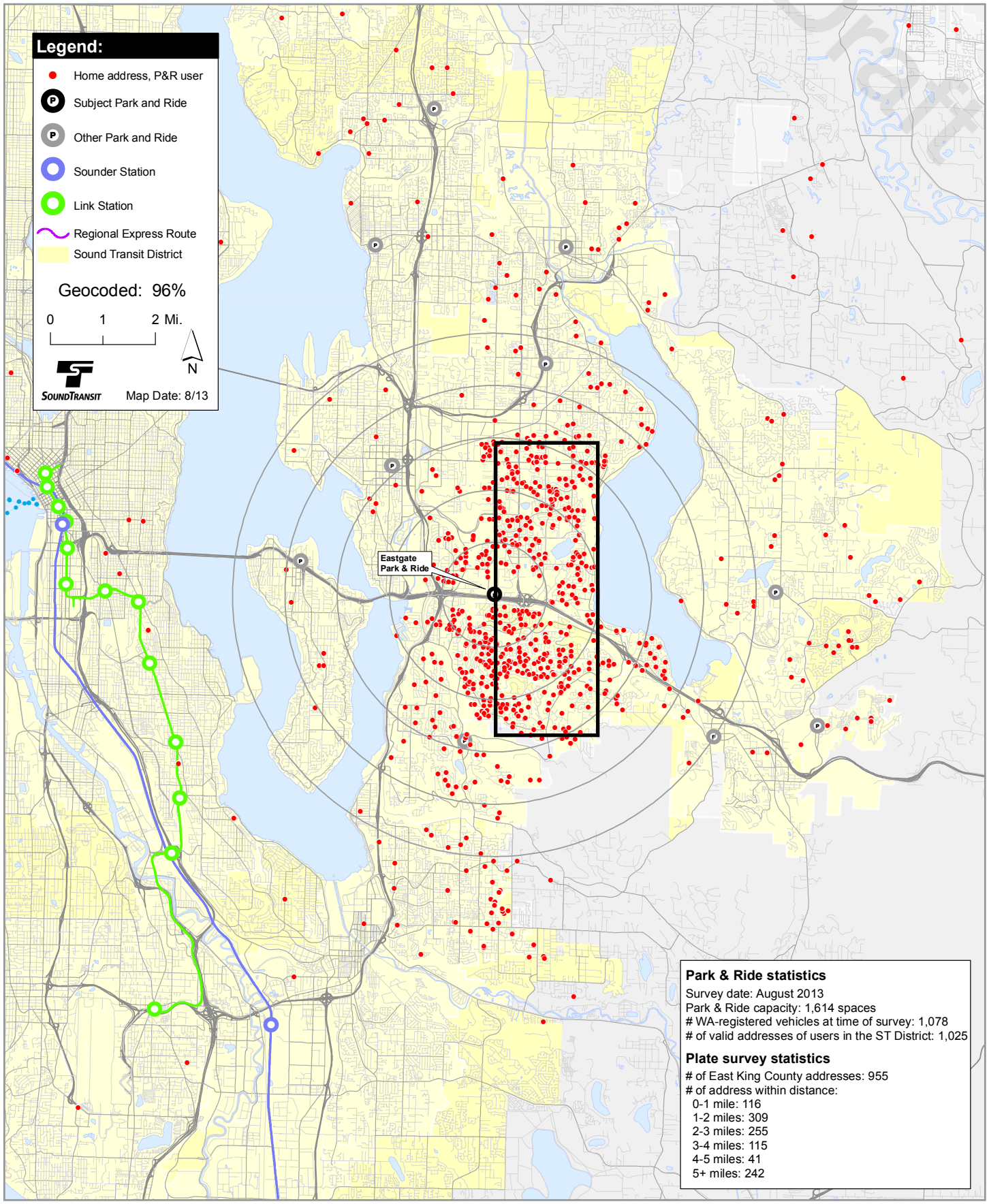
The Eastgate Park-and-Ride is a five story parking structure with a capacity of 1,614 vehicles. According to a license plate survey conducted by Sound Transit in August 2013, about 39 percent of visitors to the Eastgate Park-and-Ride come from outside of the Bellevue city limits. When the survey was conducted, 1,078 Washington-registered vehicles were present.

Appendix Figure 7 shows the distribution of lot usage by distance traveled. Only 22 percent of Eastgate Park-and-Ride users commute further than five miles. 52 percent of the lot's users commuted between one and three miles, with 29 percent commuting one to two miles to reach the lot. The pattern of distribution shows a concentration of use that forms a vertical rectangle bounded by Lake Sammamish to the east, a line extending north and south of the lot to the west, and extending three miles in both directions. The Eastgate Park-and-Ride market area, as determined by this license plate survey, is shown in Appendix Figure 8.

Appendix Figure 7 Distances traveled by users to reach the Eastgate Park-and-Ride.



Appendix Figure 8 Origins of Eastgate Park-and-Ride users.



Draft

Draft

APPENDIX C3: REQUIREMENTS TO ESTABLISH A COMMUTER PARKING FACILITY

Bellevue City Code 20.20.200

A. The applicant may propose a commuter parking facility providing no more than 50 parking spaces and utilizing the parking area of an existing use through the administrative conditional use process, Part 20.30E LUC. Appeals of decisions made pursuant to this subsection will be decided using the Process II appeal procedures, LUC 20.35.250.

B. The Director of the Development Services Department may approve a commuter parking facility described in subsection A of this section only if he/she finds that:

1. The commuter parking facility is proposed as part of a transportation program.
2. The number of parking spaces proposed for the commuter parking facility is in excess of the actual parking demand for the primary use during overlapping hours of operation.
3. The subject property abuts and gains access from a major, secondary or collector arterial as defined by the Transportation Department.
4. Signage proposed in conjunction with the commuter parking facility is adequate to identify the facility and in keeping with the general character of the immediate vicinity.
5. The location of the commuter parking facility on the subject property will have no significant adverse impact on uses in the immediate vicinity.

C. The Director of the Development Services Department may impose a time limit upon the validity of the administrative Conditional Use Permit granted pursuant to this section in order to ensure periodic review of the commuter parking facility. (Ord. 5480, 10-20-03, § 7; Ord. 4978, 3-17-97, § 1; Ord. 3530, 8-12-85, § 17; Ord. 3498, 5-27-85, §§ 10, 11)

APPENDIX C4: BUS LAYOVER NEEDS

Draft

Appendix Table 13 Estimated layover space required by route terminal location, Mobility Management Area (MMA) and/or jurisdiction.

Route Terminals	Low Estimate (feet)							High Estimate (feet)						
	AAM	AM	MD	PM	EVE	NITE	Maximum	AAM	AM	MD	PM	EVE	NITE	Maximum
Within Bellevue														
Downtown Bellevue	580	1,000	580	1,000	580	460	1,000	1,220	2,460	1,800	2,460	1,660	1,240	2,460
Bellevue Transit Center	*400*	*700*	*400*	*700*	*460*	*340*	*700*	*880*	*1,700*	*1,240*	*1,700*	*1,240*	*960*	*1,700*
Bellevue Square	*120*	*180*	*120*	*180*	*60*	*60*	*180*	*200*	*480*	*420*	*480*	*280*	*140*	*480*
Old Bellevue	*60*	*120*	*60*	*120*	*60*	*60*	*120*	*140*	*280*	*140*	*280*	*140*	*140*	*280*
Crossroads	100	160	100	160	100	100	160	260	400	260	400	260	260	400
Eastgate P&R	300	600	420	600	300	300	600	920	1,580	1,180	1,580	1,320	920	1,580
Factoria	60	120	120	120	60	60	120	280	420	280	280	280	140	420
S. Bellevue P&R	40	80	40	80	40	40	80	120	240	120	240	120	120	240
Sub-Total	***1,080***	***1,960***	***1,260***	***1,960***	***1,080***	***960***	***1,960***	***2,800***	***5,100***	***3,640***	***4,960***	***3,640***	***2,680***	***5,100***
Outside of Bellevue														
Issaquah	100	340	220	340	160	100	340	260	720	460	720	460	260	720
220th Ave SE/SE 56th St	*0*	*60*	*0*	*60*	*0*	*0*	*60*	*0*	*60*	*0*	*60*	*0*	*0*	*60*
Issaquah Highlands	*60*	*180*	*120*	*180*	*60*	*60*	*180*	*140*	*480*	*280*	*480*	*280*	*140*	*480*
Issaquah Transit Center	*40*	*100*	*100*	*100*	*100*	*40*	*100*	*120*	*180*	*180*	*180*	*180*	*120*	*180*
Kirkland Transit Center	120	240	240	240	120	120	240	420	700	560	700	560	420	700
Mercer Island P&R	60	360	0	360	0	0	360	60	360	0	360	0	0	360
Redmond	160	400	220	400	220	100	400	460	900	580	640	640	260	900
Bear Creek P&R	*0*	*60*	*0*	*60*	*0*	*0*	*60*	*0*	*60*	*0*	*60*	*0*	*0*	*60*
Education Hill	*40*	*40*	*40*	*40*	*40*	*40*	*40*	*120*	*240*	*240*	*120*	*240*	*120*	*240*
Overlake P&R	*0*	*60*	*60*	*60*	*60*	*0*	*60*	*0*	*60*	*60*	*60*	*60*	*0*	*60*
Overlake Transit Center	*60*	*120*	*0*	*120*	*60*	*0*	*120*	*60*	*120*	*0*	*120*	*60*	*0*	*120*
Redmond Transit Center	*60*	*120*	*120*	*120*	*60*	*60*	*120*	*280*	*420*	*280*	*280*	*280*	*140*	*420*
Totem Lake	60	180	60	180	120	60	180	140	340	280	340	280	140	340
Yarrow Point Fwy Stn	80	80	80	80	80	80	80	240	240	240	360	240	240	360
Total	**1,660**	**3,560**	**2,080**	**3,560**	**1,780**	**1,420**	**3,560**	**4,380**	**8,360**	**5,760**	**8,080**	**5,820**	**4,000**	**8,480**

APPENDIX C5: EXISTING BUS LAYOVER

Appendix Table 14 Existing layover space in Bellevue and the routes utilizing these spaces one or more days per week.

Stop ID	Dir.	On Street	Int	Cross Street	# of Coach Lengths	Estimated Layover Space (ft)	Routes
64802	N	124th Ave SE	FS	SE 44th St	4	80	245, 246
67014	W	Eastgate P&R Bay 1	NS	140th Ave SE	3	60	212, 226, 241
67015	W	Eastgate P&R Bay 2	NM	140th Ave SE	3	60	221
67016	S	140 Ave SE Bay B	NS	SE Eastgate Way	14	280	212
67017	E	Eastgate P&R Access Rd	FS	140th Ave SE	12	240	221, 226, 241, 246, 271
67625	N	105th Ave NE	FS	NE 2nd St	2	40	560
67636	S	110th Ave NE	FS	NE 12th St	7	140	550
67652	W	Bellevue TC Access Rd	FS	Bellevue TC Bay 9	3	60	550
67654	W	Bellevue TC Access Rd	FS	Bellevue TC Bay 7	3	60	232
67655	W	Bellevue TC Access Rd	FS	Bellevue TC Bay 8	3	60	271
68001	W	NE 6th St (BTC Bay 11)	NS	108th Ave NE	3	60	226
68003	E	NE 6th St (BTC Bay 3)	FS	108th Ave NE	6	120	B Line
68005	E	NE 6th St (BTC Bay 5)	NS	110th Ave NE	4	80	271
68007	N	108th Ave NE	NS	NE 6th St (BTC Bay 12)	3	60	249
69021	W	NE 6th St (BTC Bay 10)	NS	108th Ave NE	4	80	234, 235
70520	W	NE 23rd St	NS	98th Ave NE	3	60	246
70865	N	116th Ave NE	NS	NE 2nd Pl	2	40	237
82718	S	I-405 (SB off ramp)	NS	SE 8th St	2	40	243, 342
84268	S	South Bellevue P&R	NS	Main Entrance Rd (Bay 2)	6	120	249
85630	S	108th Ave NE (BTC Bay 1)	NS	NE 6th St	6	120	240, 241
99205	N	106th Ave NE	NS	NE 8th St	2	40	240
99210	S	108th Ave NE	FS	NE 8th St	6	120	240, 241

Note: A single coach length is designated as 20 ft.

APPENDIX D

Draft

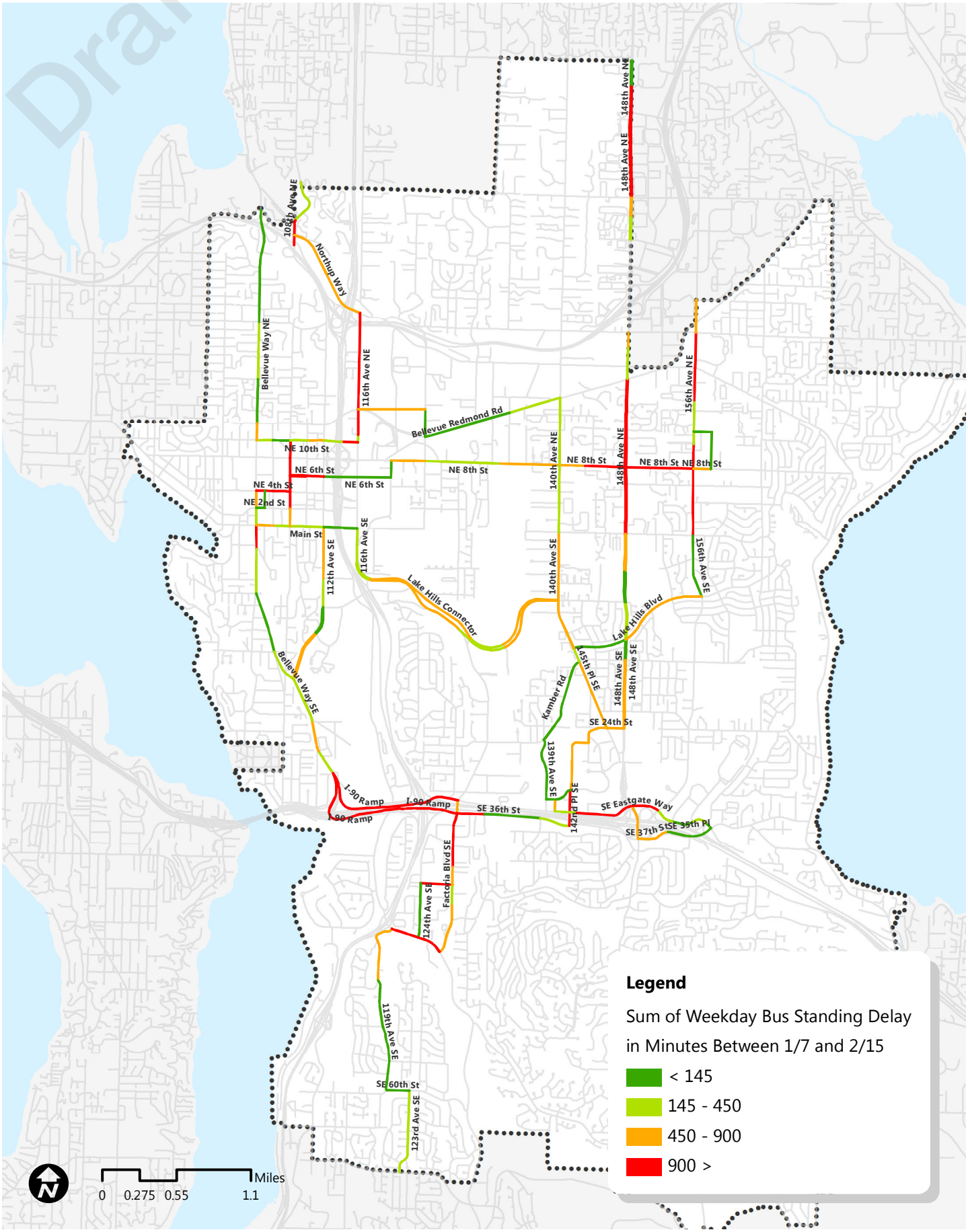
APPENDIX D1: ISSUE IDENTIFICATION MEASURE MAPS

The maps on the following pages present all of the measures used in the issue identification methodology described on pages 122 through 143. This includes the following measures:

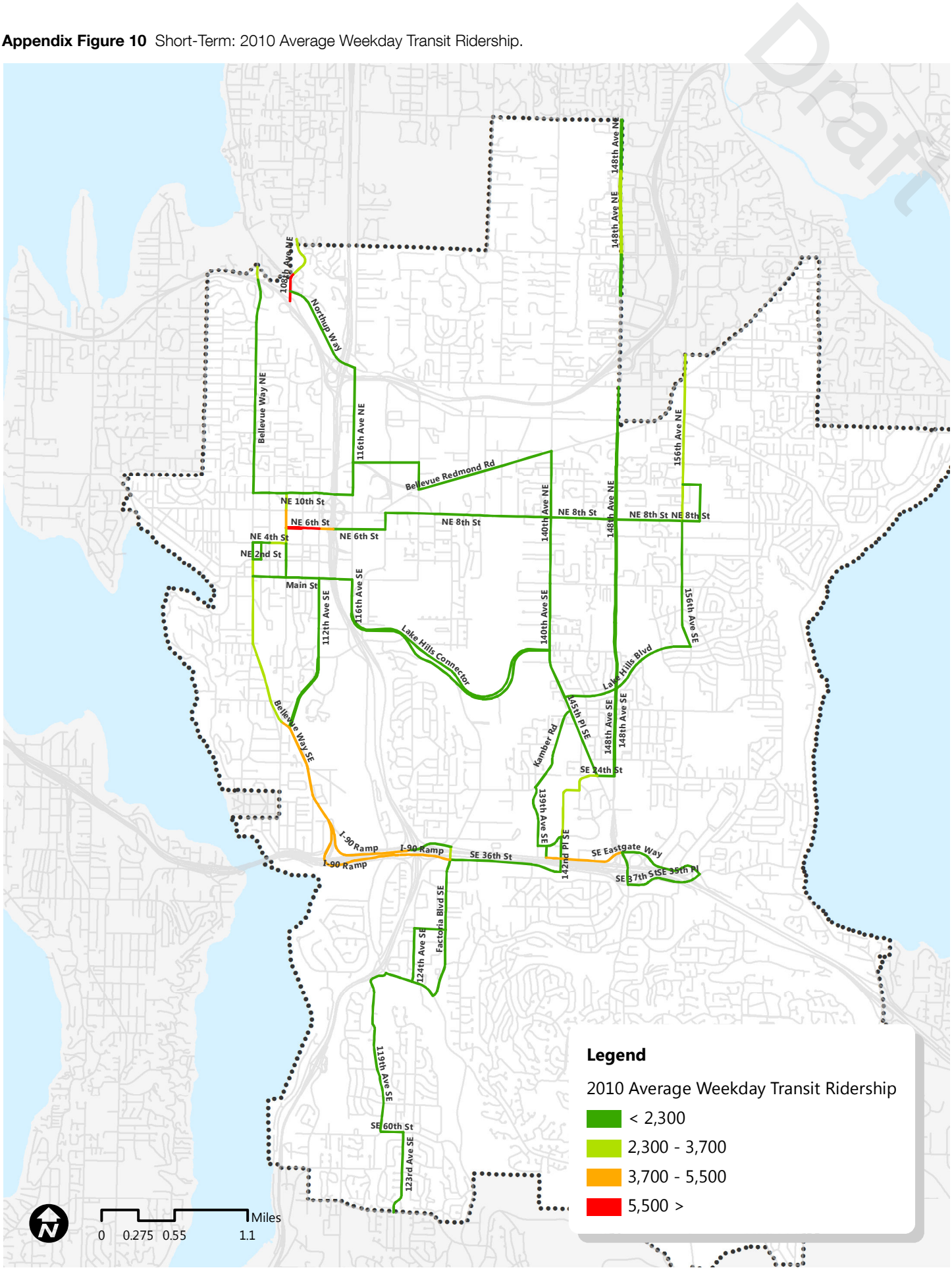
- Short Term Measures:
  - Weekday bus standing delay (in minutes)
  - 2010 average weekday transit ridership
  - 2013 weekday bus volumes
  - Coach operator survey comments

- Long-Term Measures:
  - 2030 projected average weekday transit ridership
  - 2030 planned weekday bus volumes
  - 2030 projected sum of average weekday PM peak approach delay (in seconds)
  - 2030 projected sum of average weekday PM peak approach queue length (in feet)
  - 2030 projected intersection level-of-service (LOS)

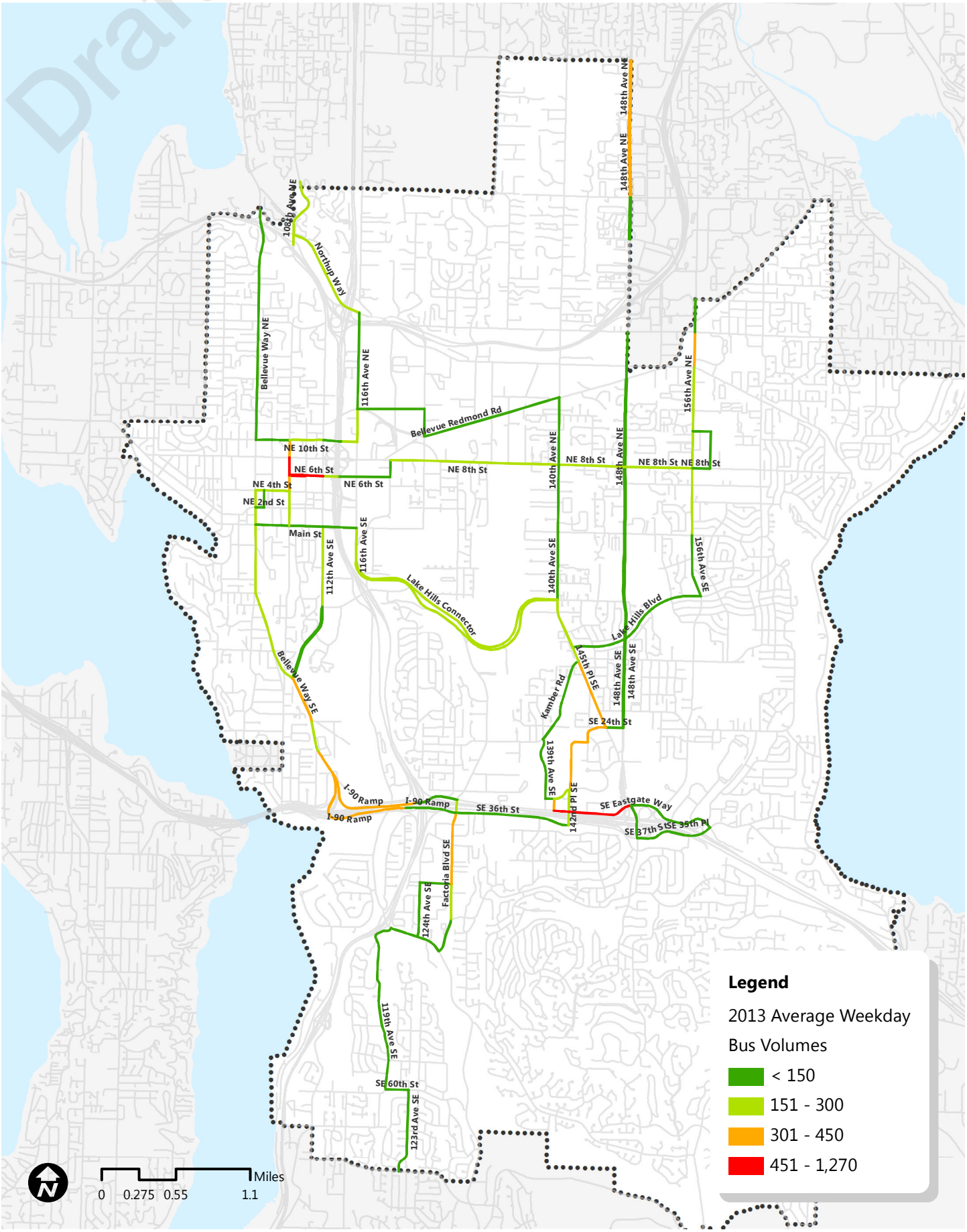
Appendix Figure 9 Short-Term: Weekday Bus Standing Delay.



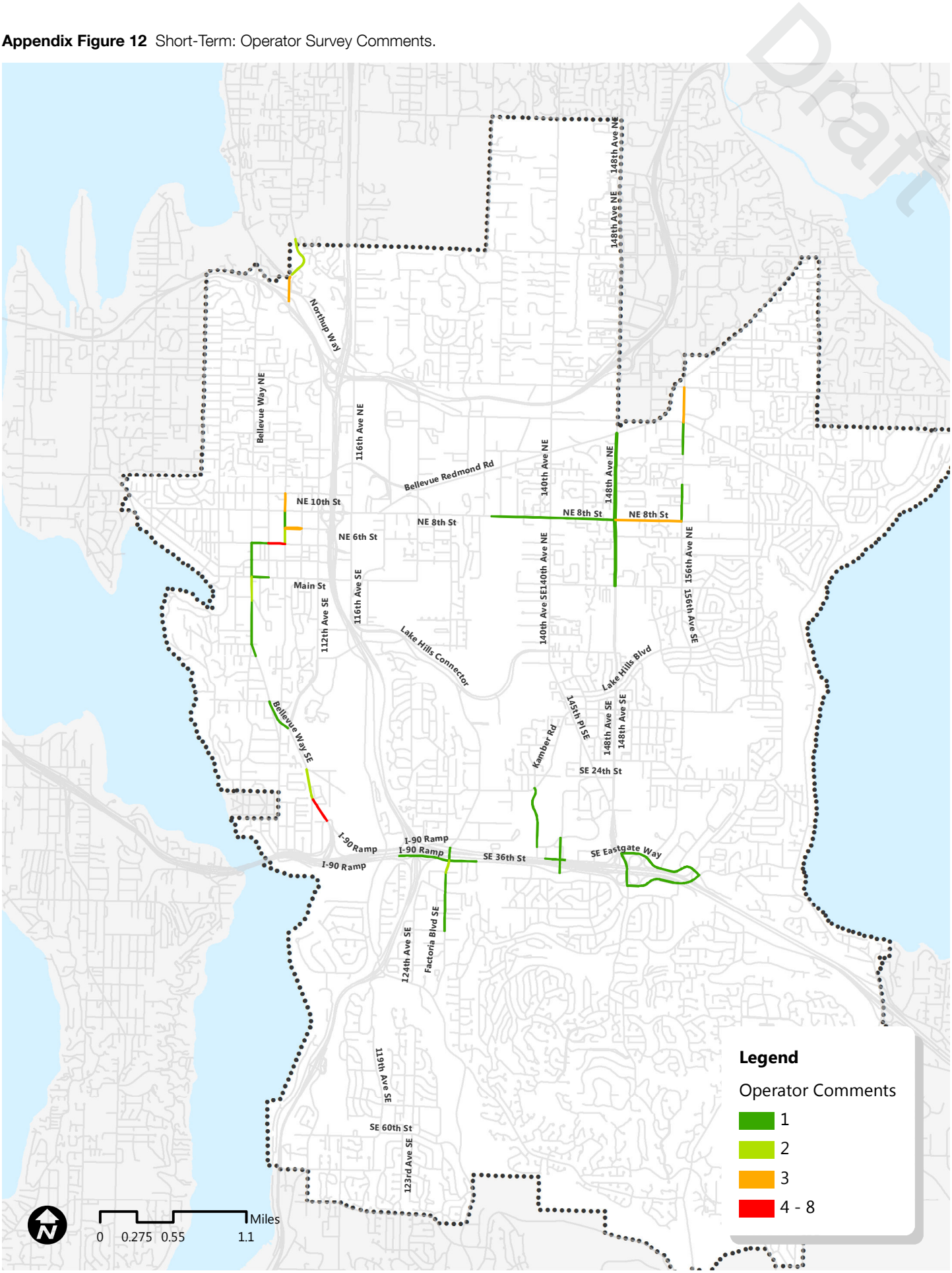
Appendix Figure 10 Short-Term: 2010 Average Weekday Transit Ridership.



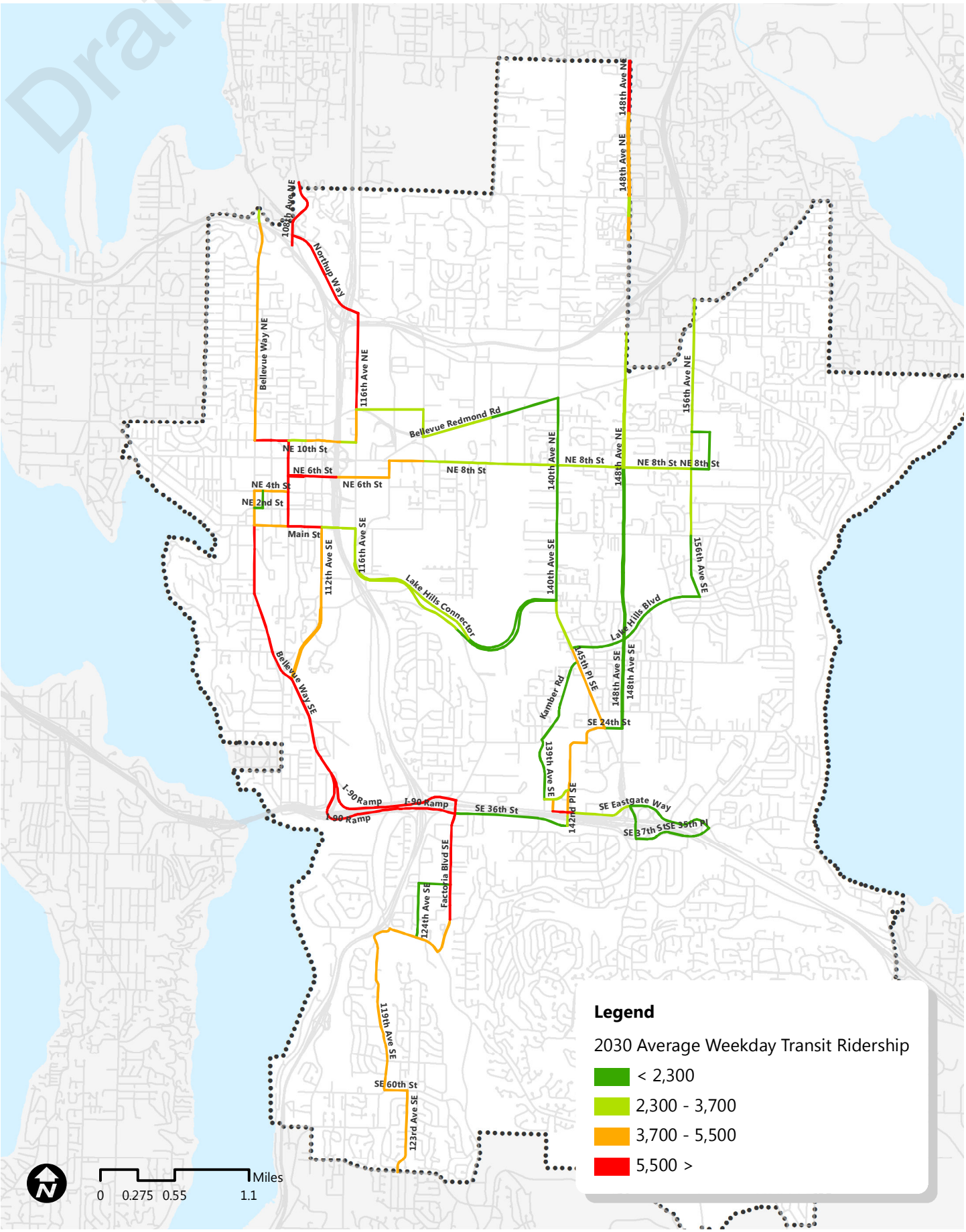
Appendix Figure 11 Short-Term: 2013 Weekday Bus Volumes.



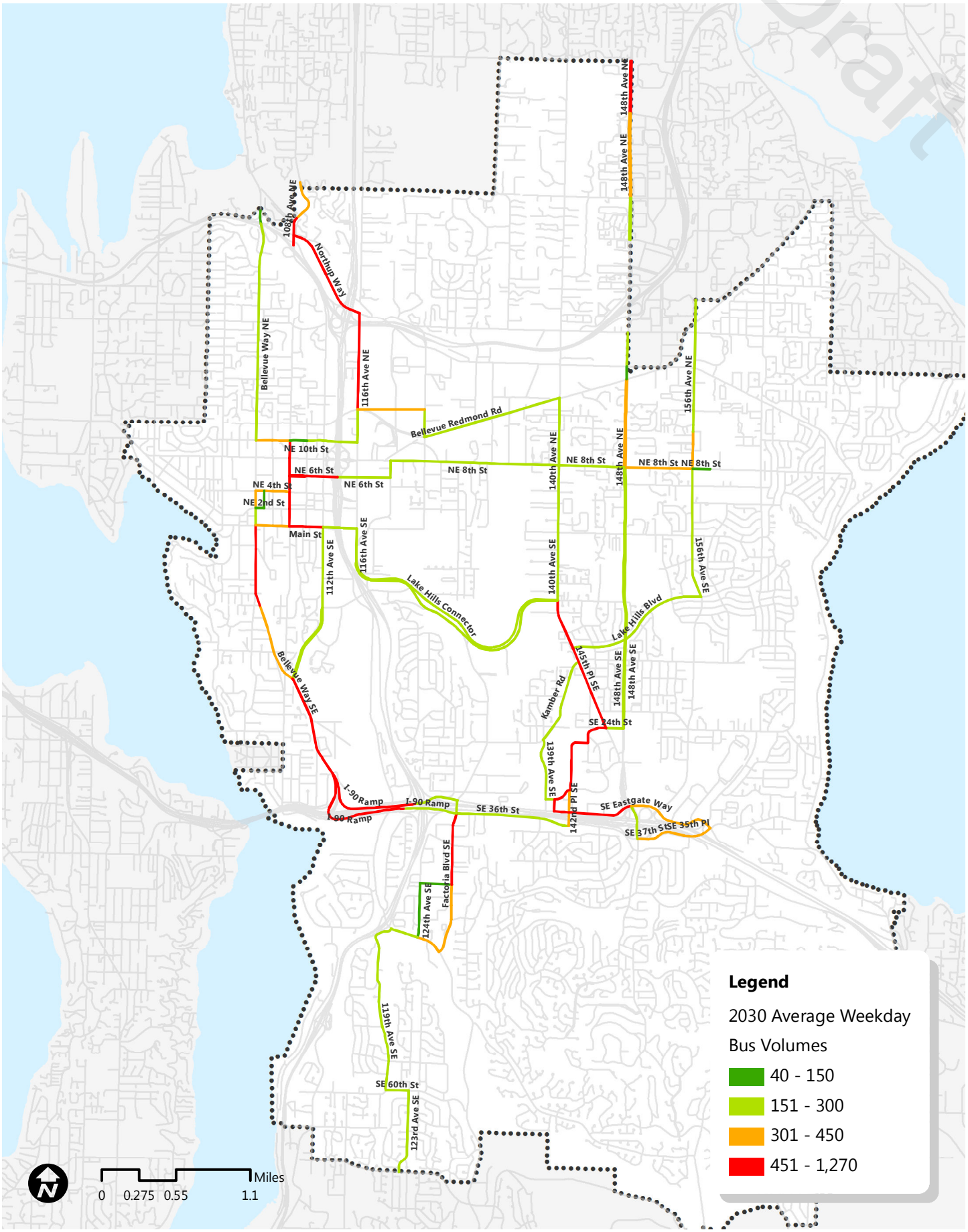
Appendix Figure 12 Short-Term: Operator Survey Comments.



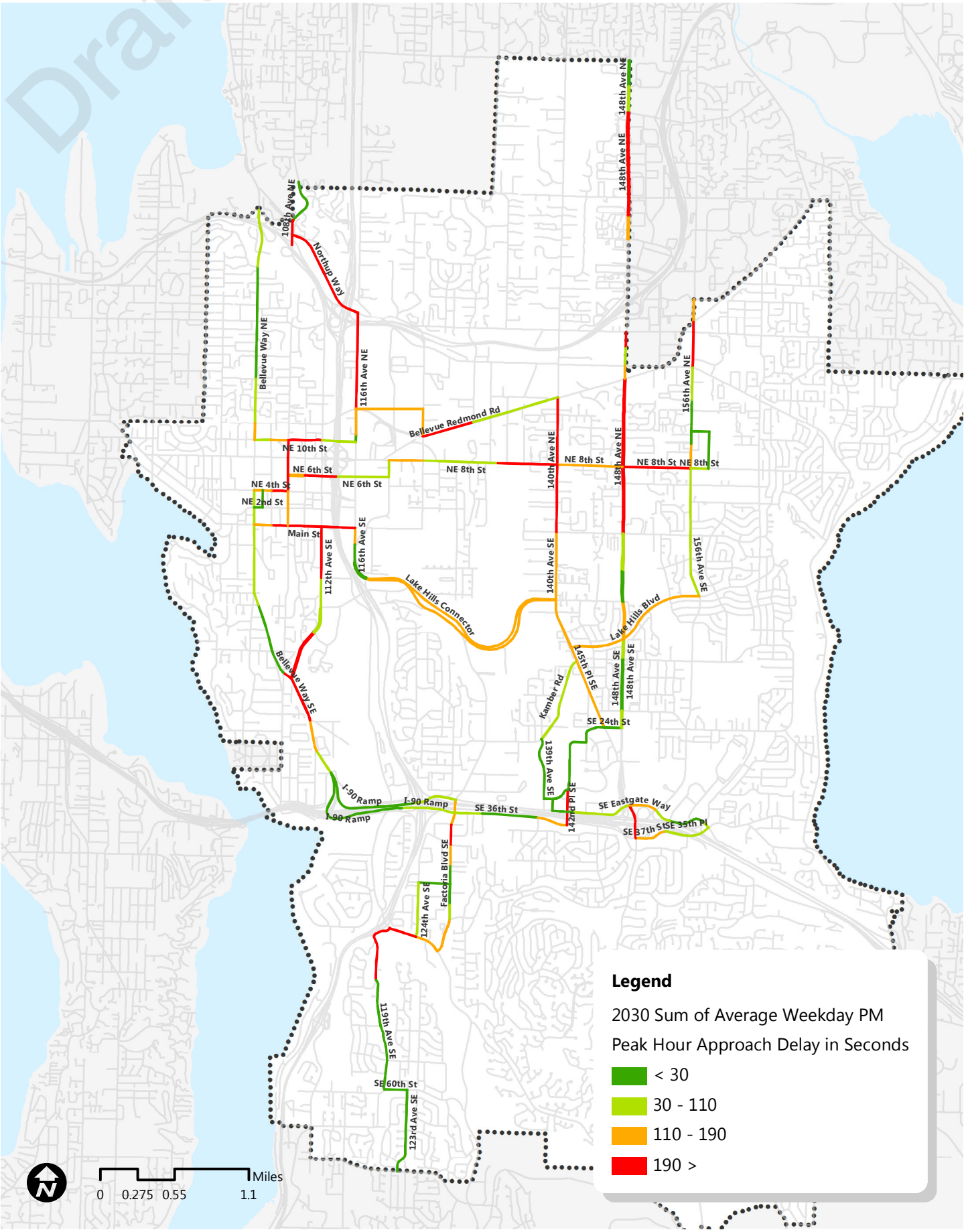
Appendix Figure 13 Long-Term: 2030 Average Weekday Transit Ridership.



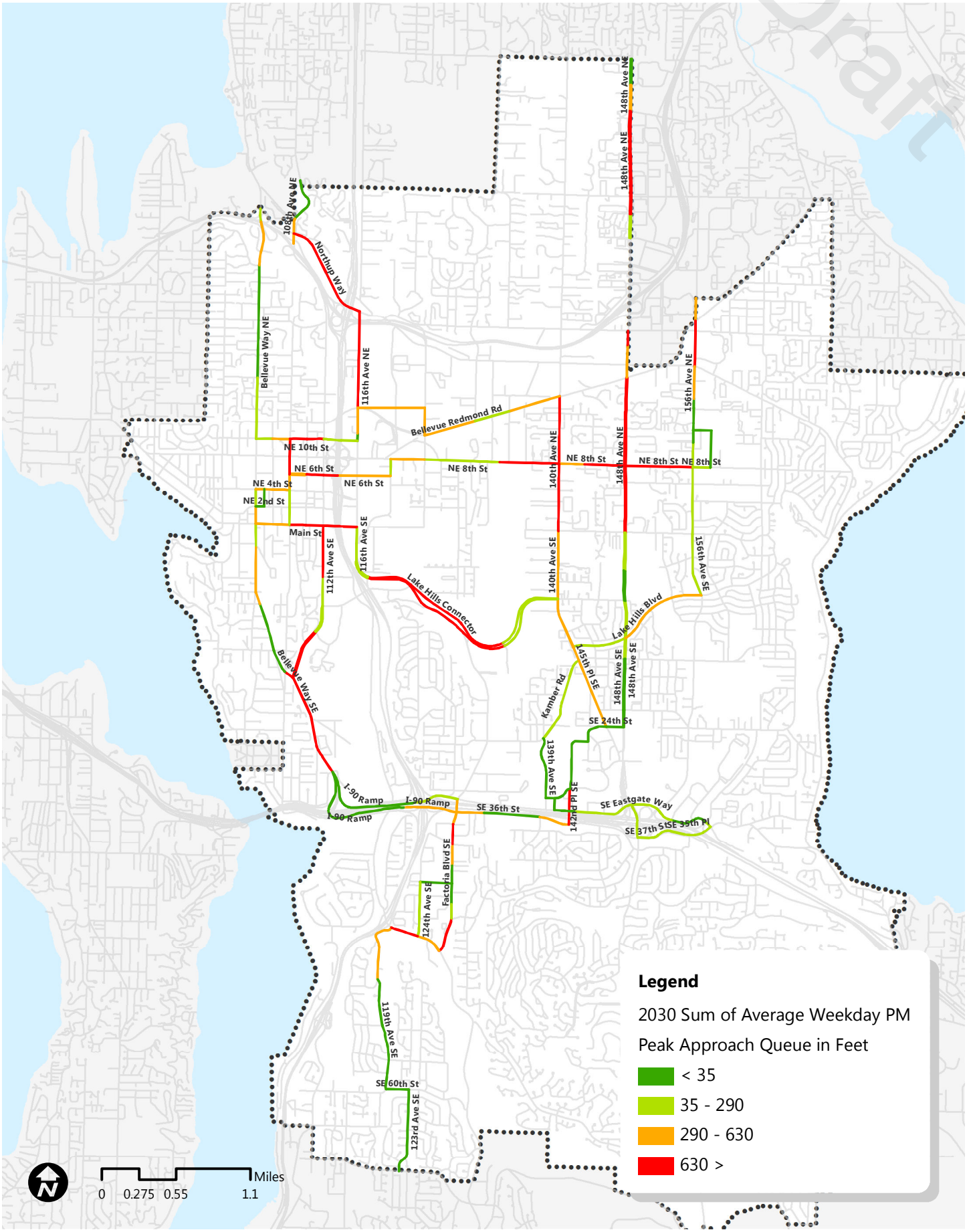
Appendix Figure 14 Long-Term: 2030 Weekday Bus Volumes.



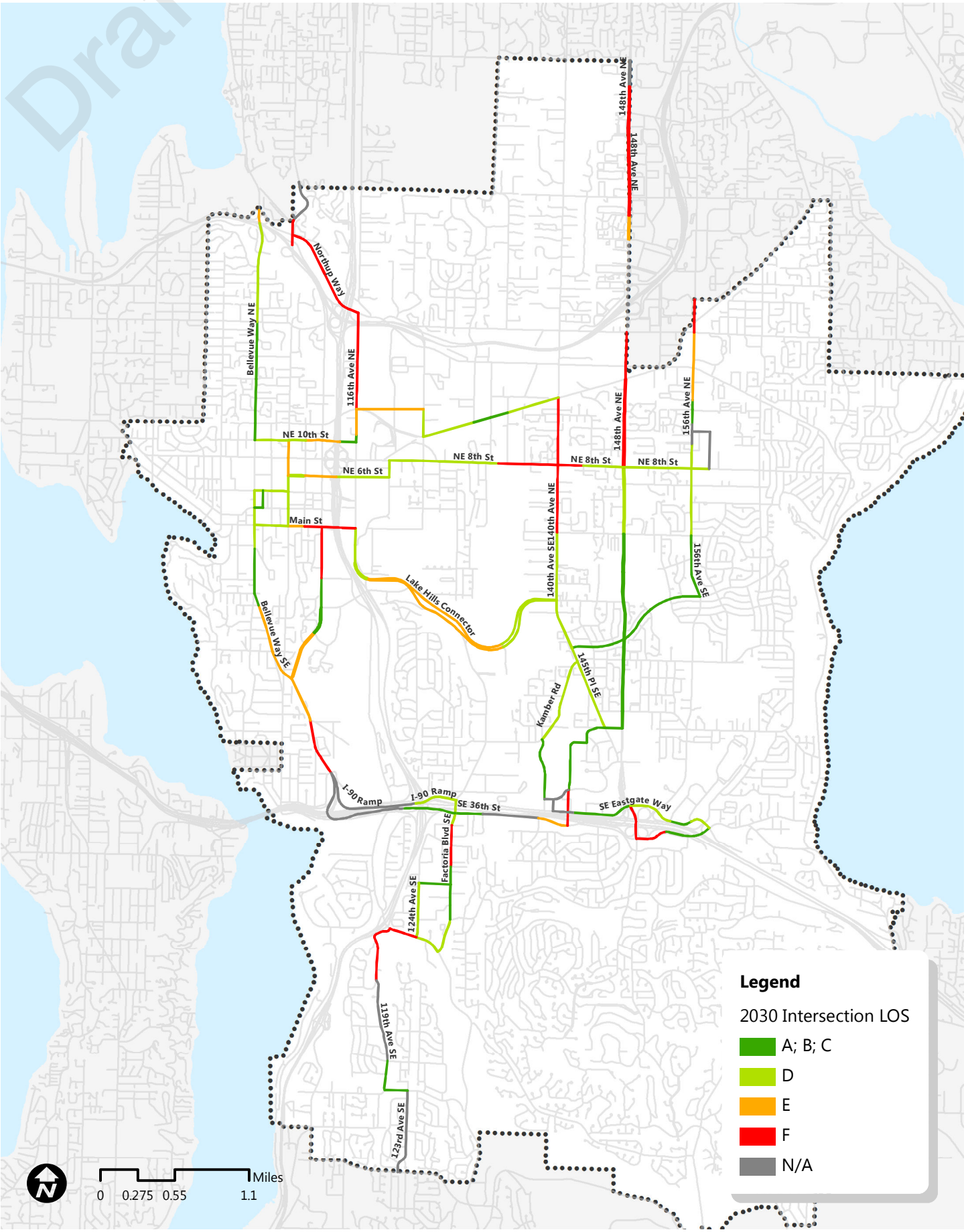
Appendix Figure 15 Long-Term: 2030 Average Weekday PM Peak Approach Delay.



Appendix Figure 16 Long-Term: 2030 Average Weekday PM Peak Approach Queue Length.



Appendix Figure 17 Long-Term: 2030 Intersection Level-of-Service (LOS).



APPENDIX D2: DATA SOURCES CONSIDERED BUT NOT USED

Draft

After additional review several data sources which were presented at the project kickoff meeting or discussed with staff will not be used. These data sources, while related to transit speed and reliability, had various issues which made them poorly fitted to the analysis, unavailable, tedious to use, or simply less useful than other similar data sources.

On-Time Performance

On-time performance is measured as the percent of trips which depart their respective time points less than two minutes early or five minutes late. For example, RapidRide B Line on-time performance is measured as the percent of trips within +/- three minute of that trip's scheduled headway. Multiple issues were identified with this data source:

1. The data is coarse, with data available only for an entire route or at some time points. Only some terminal time points can be used due to known issues with data when buses layover.
2. Delays from insufficient recovery time at route terminals can contribute to poor on-time performance.
3. On-time performance is calculated by comparing actual departure times against scheduled departure time. By adding time to a schedule, Metro planners can improve on-time performance without actually improving the speed and reliability of routes.
4. Delays occurring outside the city, especially on highways, are not directly relevant to this analysis, but their impact cannot be removed from the data.

Because of these issues and the more detailed data provided by bus GPS data, on-time performance is not used at this time.

Draft

Street Congestion

Congestion on road segments can be measured as the ratio of vehicles to roadway capacity. The closer vehicle volumes are to the capacity of the roadway, the more delay a road segment experiences. This measure was originally identified because it could help identify road segments where buses might experience delay when reentering traffic after stopping at an out-of-lane bus stop. However, because very few locations in Bellevue require buses to merge back into traffic and intersection delay is available from the more detailed Dynameq model, it was determined that this data was duplicative.

Travel Time Reliability

Reliability of travel time is highly important for transit systems. When transit travel times are unreliable the service operator must schedule extra time at the end of each trip to ensure the bus can depart on time for its next trip. This additional time, called recovery time, is necessary to operate a reliable transit system but also results in “wasted” service hours because buses are not carrying passengers during this time.

The reliability of travel time can be measured as the variation of travel time throughout the day from one time point to another. The lower the variability, the more reliable a time point interval is. While presented at the project kickoff meeting as a very important data point, further discussion with King County Metro revealed that Metro’s database structure is set up in such a way that this measure could not be calculated. Alternative approaches to use this data were reviewed because of the value of this data but no good alternative was ultimately identified.

Scheduled Speed

The average scheduled travel speed between two time points can be calculated using the scheduled travel time and distance between the time points. The first reason this data was not used is due to the lack of detail with regards to time point intervals, the route between time points, which can be several miles long. The second, more practical reason, is because King County Metro doesn't have a shapefile which time point interval data can be joined to.

Mode Share

Mode share is a ratio that describes the relative use of a street by different modes of transportation such single occupant vehicles (SOVs), high occupancy vehicles (HOVs), buses, pedestrians, and bicyclists. Whereas low-density, auto-oriented areas have a high SOV mode share, areas like Downtown have a higher non-SOV mode share. The mode share of key transit corridors will be used to identify and prioritize the locations for transit priority treatments, but this data is not available for all areas served by the Frequent Transit Network (FTN).

Draft

Draft

APPENDIX D3: CORRIDOR THROUGHPUT ANALYSIS

Following the development of composite scores for all FTN analysis segments (see pages 122 through 143), twenty corridor segments of particular interest were identified for further consideration. As reflected in the tables and charts on the following pages, composite scores and their constituent parts were compiled for each corridor, and the BKR travel demand model (MP30R6.2) was leveraged to compare vehicle throughput to person throughput, consistent with guidance from the Measures of Effectiveness Report.

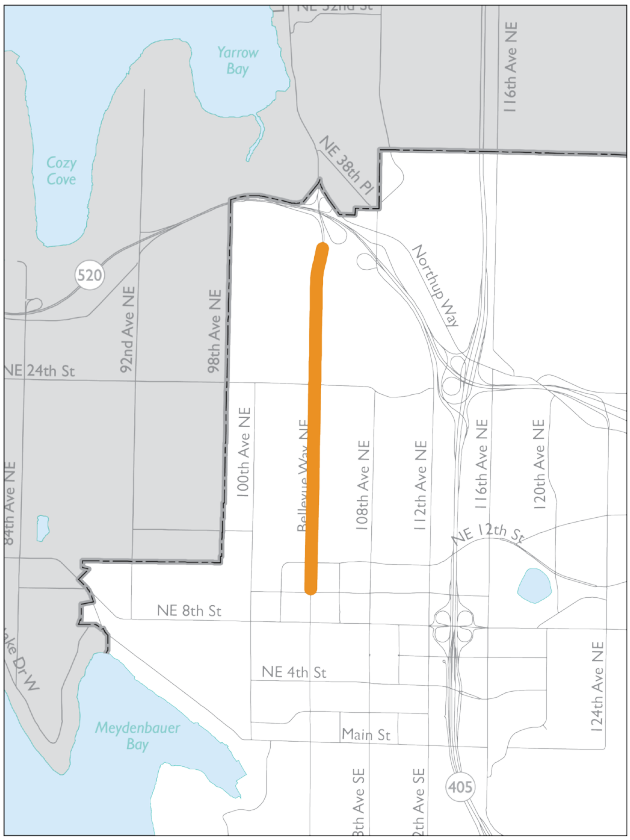
The BKR model produces Peak-Period Person Throughput (PPPT) by mode for the corridor segments that comprise the Frequent Transit Network (FTN). This takes into account average vehicle occupancy for personal vehicles and buses, thereby facilitating a comparison of vehicle and person throughput for both transit and personal vehicles along FTN corridors. For example, on Bellevue Way NE between NE 10th St and NE 32nd Pl, the 2030 projected PPPT on transit is 36 percent of all person trips, yet transit represents only 0.8 percent of all vehicle trips along this corridor. Clearly, bus service is projected to make efficient use of the roadway capacity here.

Whereas the composite scores indicate how great a particular corridor's need is for transit speed and reliability investments relative to other FTN corridors, the throughput analysis provides insight into the relative share of total person trips served by transit and private vehicles. The composite scores help to prioritize corridors for potential projects based solely on characteristics that directly affect transit operations, while throughput by mode helps to assess how reasonable it might be to allocate limited right-of-way to one mode or another based on their relative ability to move people. The larger the share of person trips served by transit along a corridor, the more appropriate it may be to consider transit priority projects.

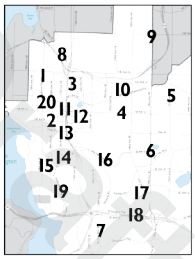
Appendix Table 15 Legend of Long-Term Weighted Score color-coded tables.

LEGEND	Weighted Scores[2] Long-Term			
Composite Score	5-11	12-15	16-18	19-24
Weekday Ridership	0-2	4	6	8
Weekday Bus Volumes	1	2	3	4
Approach Delay (sec)	1	2	3	4
Approach Queue Length (ft)	1	2	3	4
Intersection LOS	0-1	2	3	4

2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.



Bellevue Way NE btw NE 10th St and NE 32nd Pl



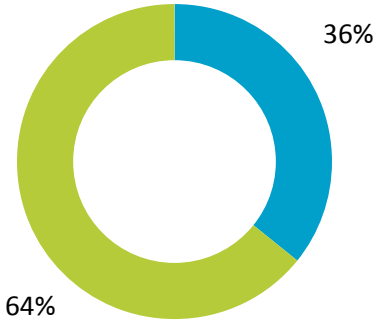
Buses[1]	16
Total Vehicles[1]	2,109
Percent Transit[1]	0.8%
Person Trips – Transit[1]	1,583
Person Trips – Total[1]	4,420
Percent Transit[1]	36%

[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

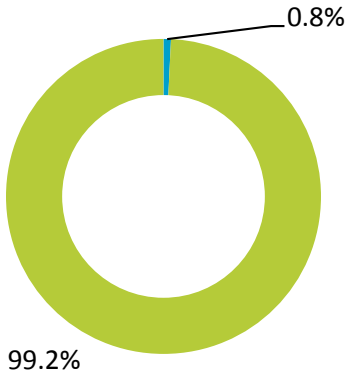
	Weighted Scores[2] Long-Term
Composite Score	11 - 15 (13.0)
Weekday Ridership	6
Weekday Bus Volumes	2
Approach Delay (sec)	1 - 3 (1.8)
Approach Queue Length (ft)	1 - 3 (1.8)
Intersection LOS	1 - 2 (1.4)

1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]
2030 PM Peak



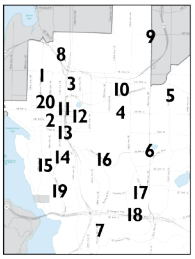
Person Throughput



Vehicle Throughput

Bus Auto

2 108th Ave NE btw Main St and NE 10th St



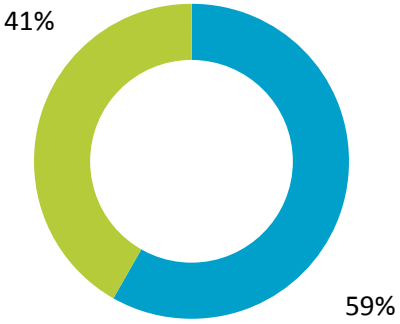
Buses[1]	62
Total Vehicles[1]	2,022
Percent Transit[1]	3.0%
Person Trips – Transit[1]	3,966
Person Trips – Total[1]	6,678
Percent Transit[1]	59%

[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

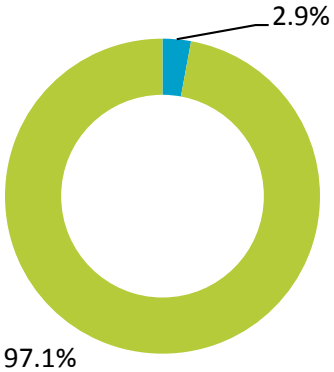
	Weighted Scores[2] Long-Term
Composite Score	19 - 23 (21.0)
Weekday Ridership	8
Weekday Bus Volumes	4
Approach Delay (sec)	3 - 4 (3.6)
Approach Queue Length (ft)	2 - 4 (3.0)
Intersection LOS	2 - 3 (2.4)

1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]
2030 PM Peak



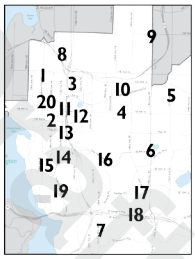
Person Throughput



Vehicle Throughput

Bus Auto

3 116th Ave NE btw NE 12th St and Northup Way



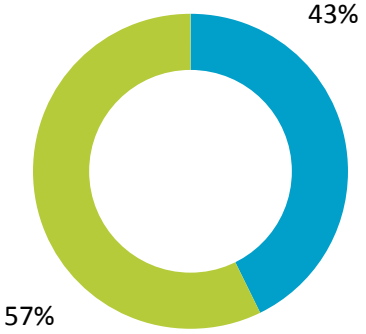
Buses[1]	23
Total Vehicles[1]	1,518
Percent Transit[1]	1.5%
Person Trips – Transit[1]	1,480
Person Trips – Total[1]	3,465
Percent Transit[1]	43%

[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

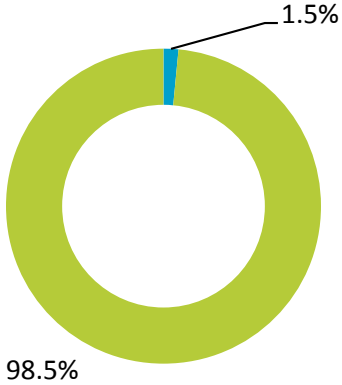
	Weighted Scores[2] Long-Term
Composite Score	24
Weekday Ridership	8
Weekday Bus Volumes	4
Approach Delay (sec)	4
Approach Queue Length (ft)	4
Intersection LOS	4

1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]
2030 PM Peak

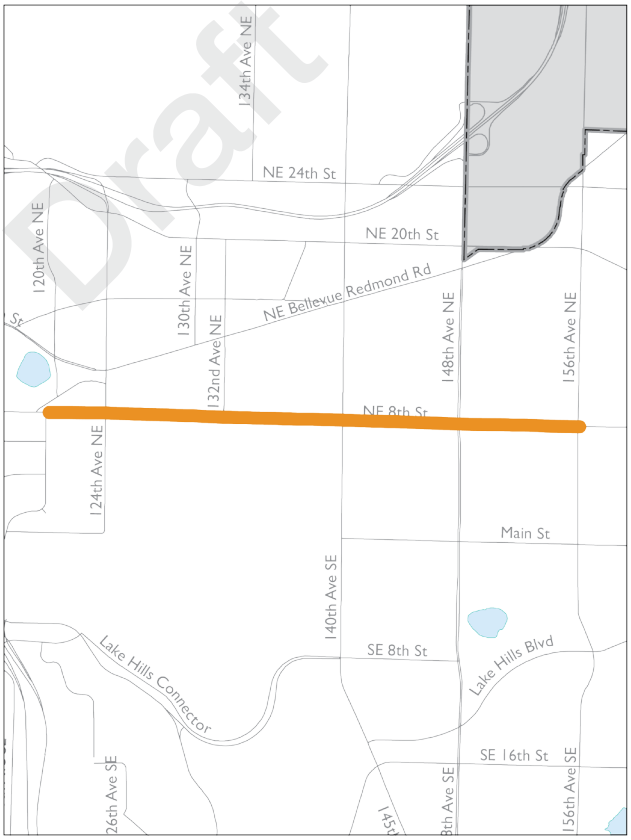


Person Throughput

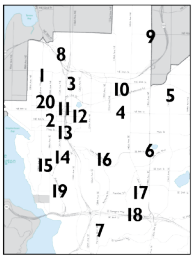


Vehicle Throughput

Bus Auto



4 NE 8th St btw 120th Ave NE and 156th Ave NE



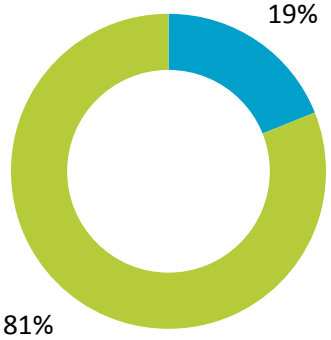
Buses[1]	17
Total Vehicles[1]	2,703
Percent Transit[1]	0.6%
Person Trips – Transit[1]	871
Person Trips – Total[1]	4,606
Percent Transit[1]	19%

[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

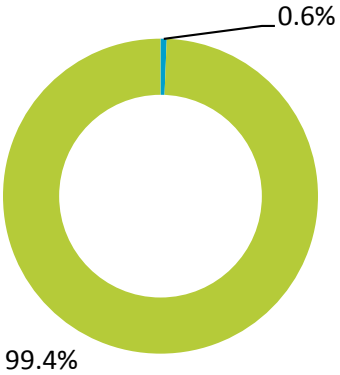
	Weighted Scores[2] Long-Term
Composite Score	12 - 18 (15.8)
Weekday Ridership	4 - 6 (4.3)
Weekday Bus Volumes	2 - 3 (2.2)
Approach Delay (sec)	2 - 4 (3.3)
Approach Queue Length (ft)	2 - 4 (3.3)
Intersection LOS	2 - 4 (2.7)

1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]
2030 PM Peak

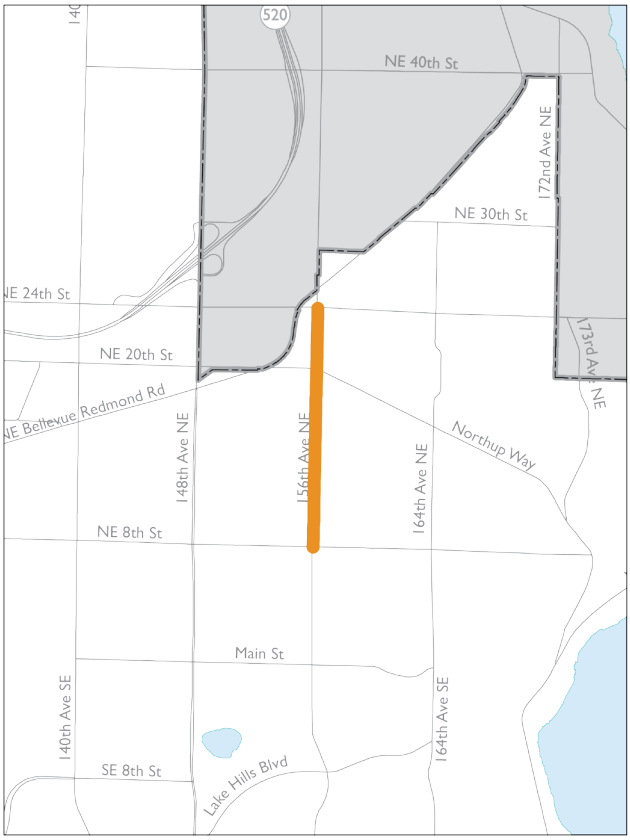


Person Throughput

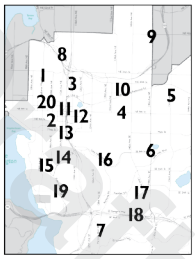


Vehicle Throughput

Bus Auto



5 156th Ave NE btw NE 8th St and Bel-Red Rd



Draft

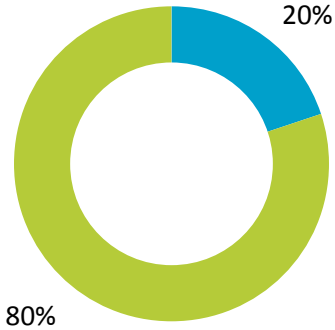
Buses[1]	22
Total Vehicles[1]	2,799
Percent Transit[1]	0.8%
Person Trips – Transit[1]	903
Person Trips – Total[1]	4,547
Percent Transit[1]	20%

[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

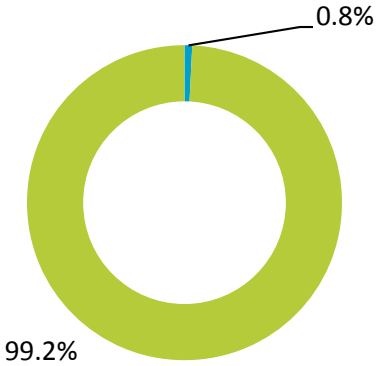
	Weighted Scores[2] Long-Term
Composite Score	8 - 17 (11.4)
Weekday Ridership	4
Weekday Bus Volumes	2 - 3 (2.3)
Approach Delay (sec)	1 - 4 (1.9)
Approach Queue Length (ft)	1 - 4 (1.9)
Intersection LOS	0 - 3 (1.4)

1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1] 2030 PM Peak

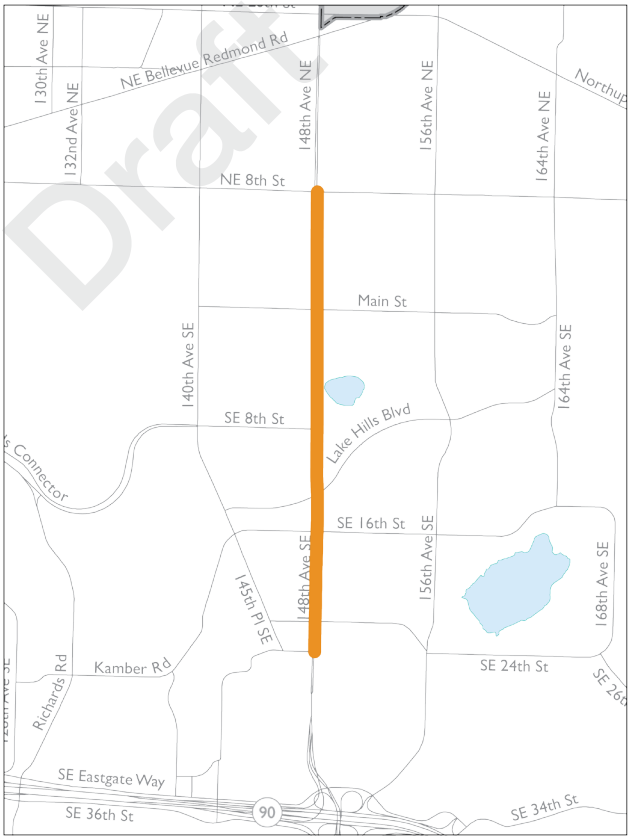


Person Throughput

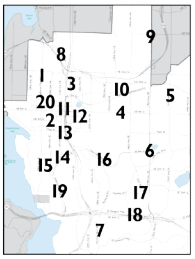


Vehicle Throughput

Bus Auto



6 148th Ave NE btw NE 8th St and SE 24th St



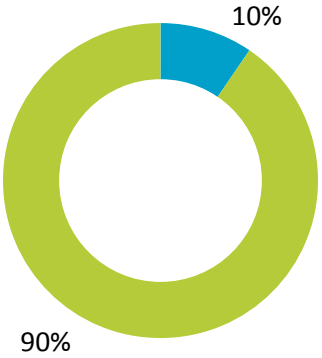
Buses[1]	16
Total Vehicles[1]	3,281
Percent Transit[1]	0.5%
Person Trips – Transit[1]	432
Person Trips – Total[1]	4,527
Percent Transit[1]	10%

[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

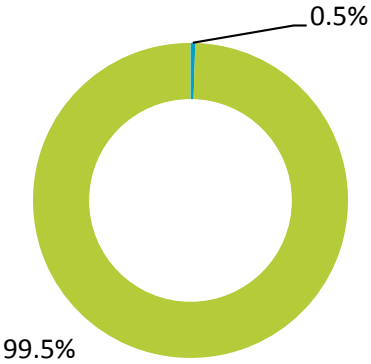
	Weighted Scores[2] Long-Term
Composite Score	6 - 14 (9.1)
Weekday Ridership	2
Weekday Bus Volumes	2
Approach Delay (sec)	1 - 4 (2.3)
Approach Queue Length (ft)	1 - 4 (1.9)
Intersection LOS	0 - 2 (1.0)

1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]
2030 PM Peak



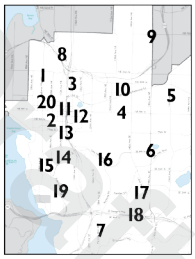
Person Throughput



Vehicle Throughput

Bus Auto

7 Factoria Blvd SE btw SE 36th St and SE Newport Way



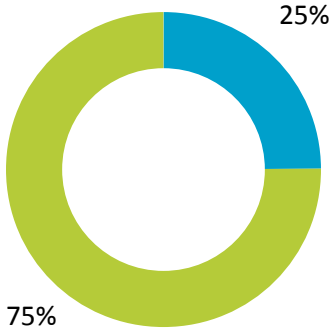
Buses[1]	34
Total Vehicles[1]	3,597
Percent Transit[1]	0.9%
Person Trips – Transit[1]	1,515
Person Trips – Total[1]	6,080
Percent Transit[1]	25%

[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

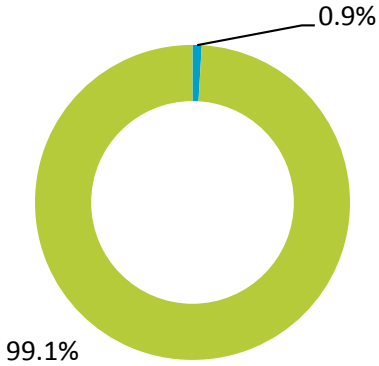
	Weighted Scores[2] Long-Term
Composite Score	13 - 24 (16.8)
Weekday Ridership	8
Weekday Bus Volumes	3 - 4 (3.6)
Approach Delay (sec)	1 - 4 (2.0)
Approach Queue Length (ft)	1 - 4 (2.0)
Intersection LOS	0 - 4 (1.2)

1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]
2030 PM Peak



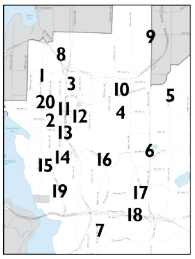
Person Throughput



Vehicle Throughput

Bus Auto

8 Northup Way btw 108th Ave NE and 116th Ave NE



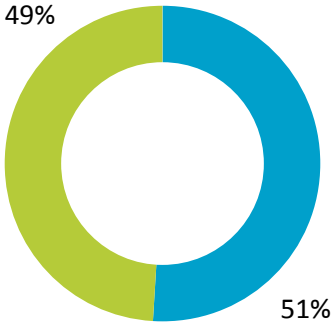
Buses[1]	30
Total Vehicles[1]	1,460
Percent Transit[1]	2.1%
Person Trips – Transit[1]	1,850
Person Trips – Total[1]	3,620
Percent Transit[1]	51%

[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

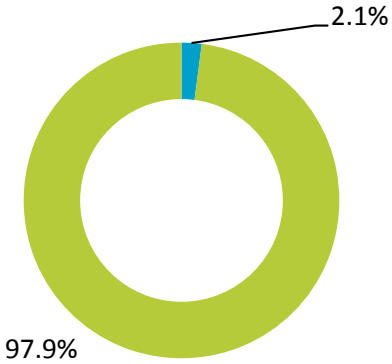
	Weighted Scores[2] Long-Term
Composite Score	24
Weekday Ridership	8
Weekday Bus Volumes	4
Approach Delay (sec)	4
Approach Queue Length (ft)	4
Intersection LOS	4

1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]
2030 PM Peak

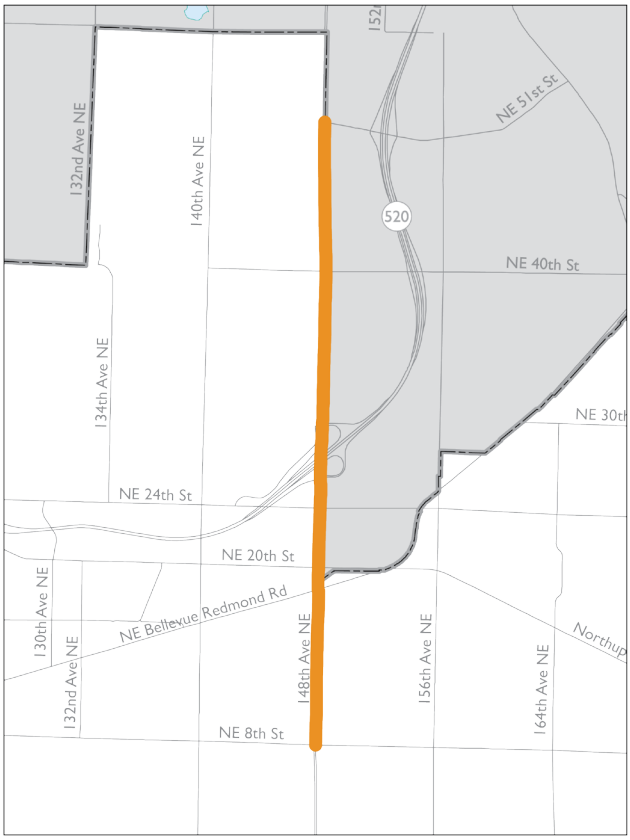


Person Throughput

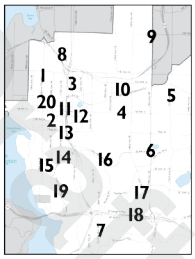


Vehicle Throughput

Bus Auto



9 148th Ave NE btw NE 8th St & NE 51st St



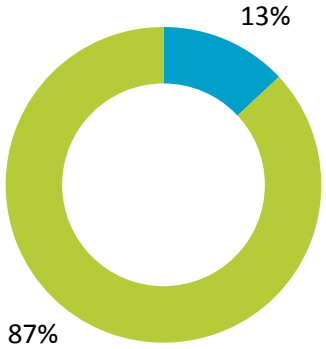
Buses[1]	15
Total Vehicles[1]	3,606
Percent Transit[1]	0.4%
Person Trips – Transit[1]	699
Person Trips – Total[1]	5,359
Percent Transit[1]	13%

[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

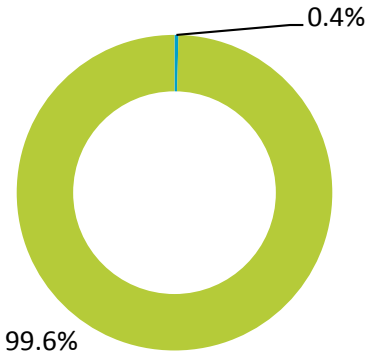
	Weighted Scores[2] Long-Term
Composite Score	14 - 21 (17.8)
Weekday Ridership	4 - 8 (5.4)
Weekday Bus Volumes	1 - 4 (2.6)
Approach Delay (sec)	1 - 4 (3.1)
Approach Queue Length (ft)	1 - 4 (3.2)
Intersection LOS	0 - 4 (3.5)

1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]
2030 PM Peak

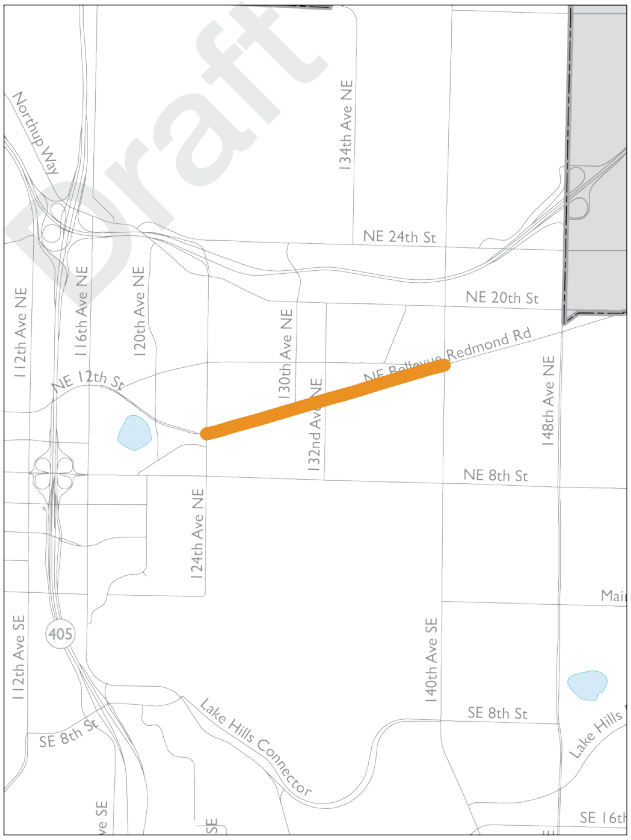


Person Throughput

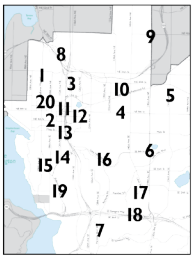


Vehicle Throughput

Bus Auto



10 Bel-Red Rd btw 124th Ave NE and 140th Ave NE



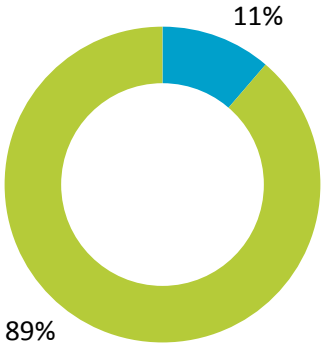
Buses[1]	16
Total Vehicles[1]	3,266
Percent Transit[1]	0.5%
Person Trips – Transit[1]	558
Person Trips – Total[1]	4,935
Percent Transit[1]	11%

[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

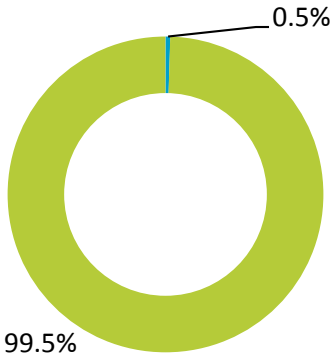
	Weighted Scores[2] Long-Term
Composite Score	8 - 15 (11.0)
Weekday Ridership	2 - 4 (3.0)
Weekday Bus Volumes	2
Approach Delay (sec)	2 - 4 (2.5)
Approach Queue Length (ft)	2 - 3 (2.5)
Intersection LOS	0 - 2 (1.0)

1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]
2030 PM Peak



Person Throughput

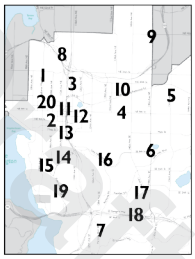


Vehicle Throughput

Bus Auto

11

NE 8th St btw Bellevue Way NE and 120th Ave NE



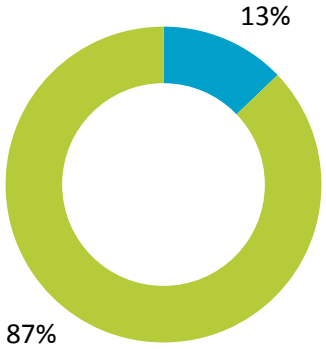
Buses[1]	14
Total Vehicles[1]	3,412
Percent Transit[1]	0.4%
Person Trips – Transit[1]	670
Person Trips – Total[1]	5,230
Percent Transit[1]	13%

[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

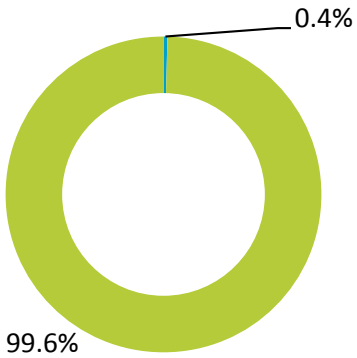
	Weighted Scores[2] Long-Term
Composite Score	**N/A**
Weekday Ridership	**N/A**
Weekday Bus Volumes	**N/A**
Approach Delay (sec)	**N/A**
Approach Queue Length (ft)	**N/A**
Intersection LOS	**N/A**

1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]
2030 PM Peak

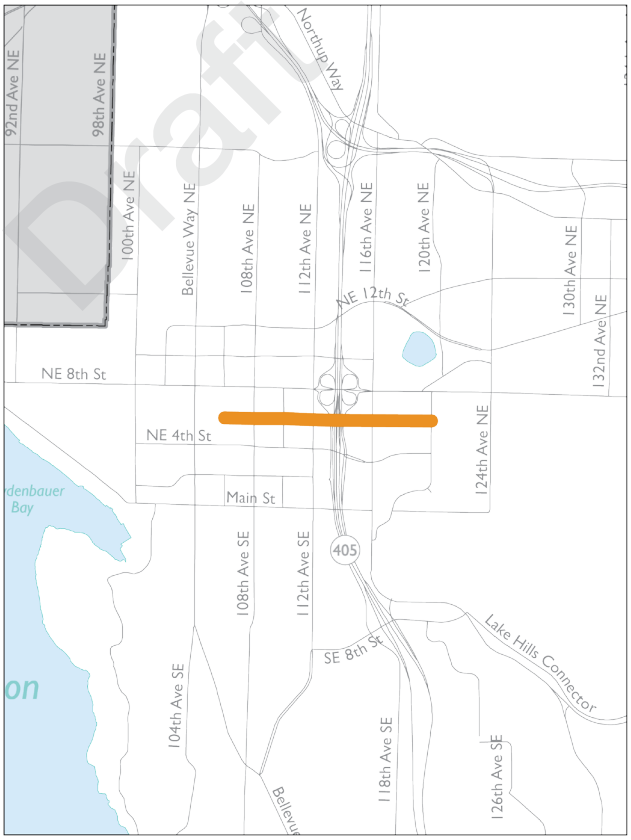


Person Throughput

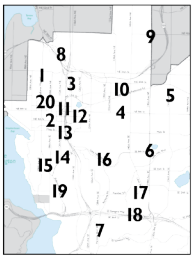


Vehicle Throughput

Bus Auto



12 NE 6th St btw 106th Ave NE and 120th Ave NE



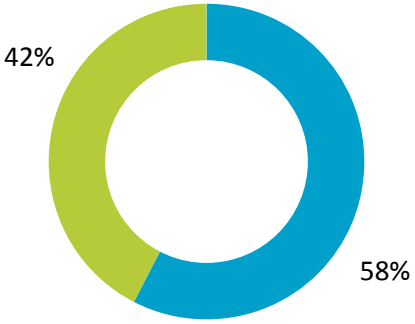
Buses[1]	71
Total Vehicles[1]	2,588
Percent Transit[1]	2.7%
Person Trips – Transit[1]	5,713
Person Trips – Total[1]	9,920
Percent Transit[1]	58%

[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

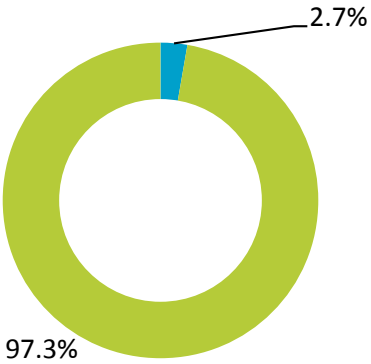
	Weighted Scores[2] Long-Term
Composite Score	15 - 23 (20.3)
Weekday Ridership	6 - 8 (7.5)
Weekday Bus Volumes	2 - 4 (3.5)
Approach Delay (sec)	2 - 4 (3.3)
Approach Queue Length (ft)	3 - 4 (3.5)
Intersection LOS	2 - 3 (2.5)

1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]
2030 PM Peak



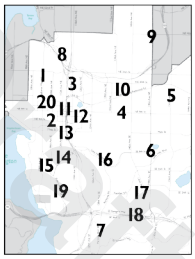
Person Throughput



Vehicle Throughput

Bus Auto

13 Main St btw Bellevue Way NE and 116th Ave NE



Draft

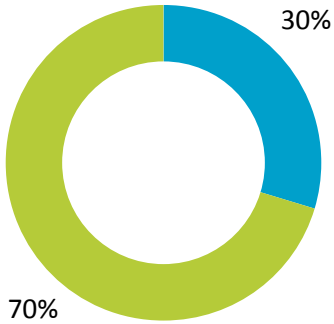
Buses[1]	23
Total Vehicles[1]	2,583
Percent Transit[1]	0.9%
Person Trips – Transit[1]	1,410
Person Trips – Total[1]	4,750
Percent Transit[1]	30%

[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

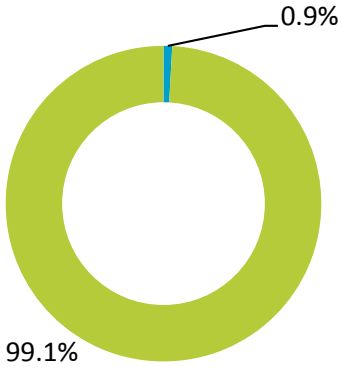
	Weighted Scores[2] Long-Term
Composite Score	17 - 24 (20.0)
Weekday Ridership	4 - 8 (6.4)
Weekday Bus Volumes	2 - 4 (3.2)
Approach Delay (sec)	3 - 4 (3.8)
Approach Queue Length (ft)	3 - 4 (3.6)
Intersection LOS	2 - 4 (3.0)

1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]
2030 PM Peak



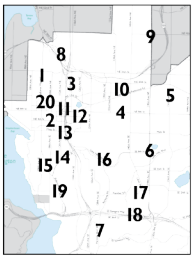
Person Throughput



Vehicle Throughput

Bus Auto

14 112th Ave SE btw Main St and Bellevue Way SE



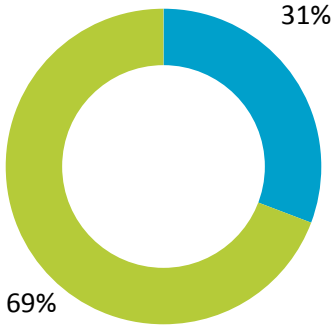
Buses[1]	16
Total Vehicles[1]	2,311
Percent Transit[1]	0.7%
Person Trips – Transit[1]	1,370
Person Trips – Total[1]	4,450
Percent Transit[1]	31%

[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

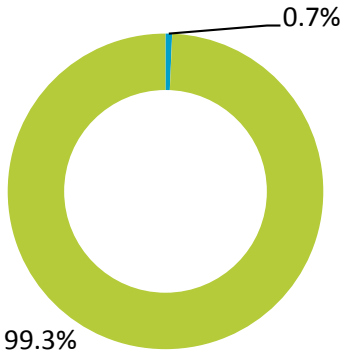
	Weighted Scores[2] Long-Term
Composite Score	12 - 20 (15.8)
Weekday Ridership	6
Weekday Bus Volumes	2
Approach Delay (sec)	2 - 4 (3.0)
Approach Queue Length (ft)	2 - 4 (3.0)
Intersection LOS	0 - 4 (1.8)

1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]
2030 PM Peak



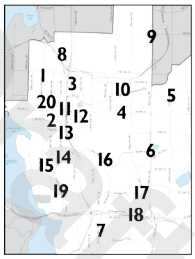
Person Throughput



Vehicle Throughput

Bus Auto

15 Bellevue Way SE btw SE 8th St and 113th Ave SE



Draft

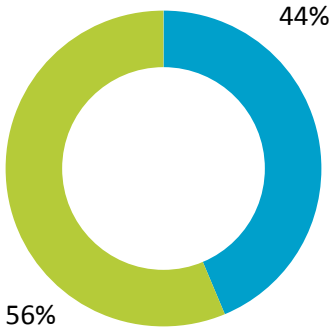
Buses[1]	36
Total Vehicles[1]	3,230
Percent Transit[1]	1.1%
Person Trips – Transit[1]	3,363
Person Trips – Total[1]	7,705
Percent Transit[1]	44%

[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

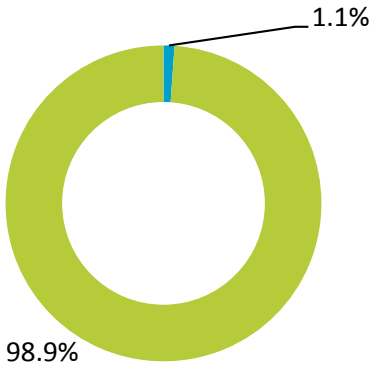
	Weighted Scores[2] Long-Term
Composite Score	16 - 22 (18.0)
Weekday Ridership	8
Weekday Bus Volumes	3 - 4 (3.3)
Approach Delay (sec)	1 - 4 (2.0)
Approach Queue Length (ft)	1 - 4 (2.3)
Intersection LOS	1 - 3 (2.5)

1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]
2030 PM Peak



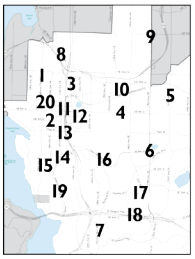
Person Throughput



Vehicle Throughput

Bus Auto

16 Lake Hills Connector btw SE 1st St and 150th Ave SE



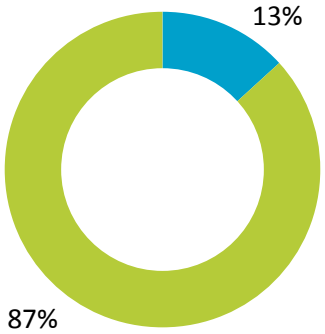
Buses[1]	16
Total Vehicles[1]	3,081
Percent Transit[1]	0.5%
Person Trips – Transit[1]	595
Person Trips – Total[1]	4,498
Percent Transit[1]	13%

[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

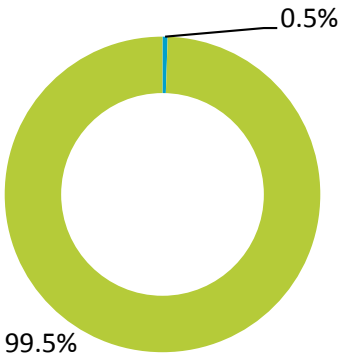
	Weighted Scores[2] Long-Term
Composite Score	11 - 16 (13.6)
Weekday Ridership	2 - 4 (3.2)
Weekday Bus Volumes	2
Approach Delay (sec)	1 - 3 (2.6)
Approach Queue Length (ft)	2 - 4 (3.2)
Intersection LOS	2 - 3 (2.6)

1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]
2030 PM Peak

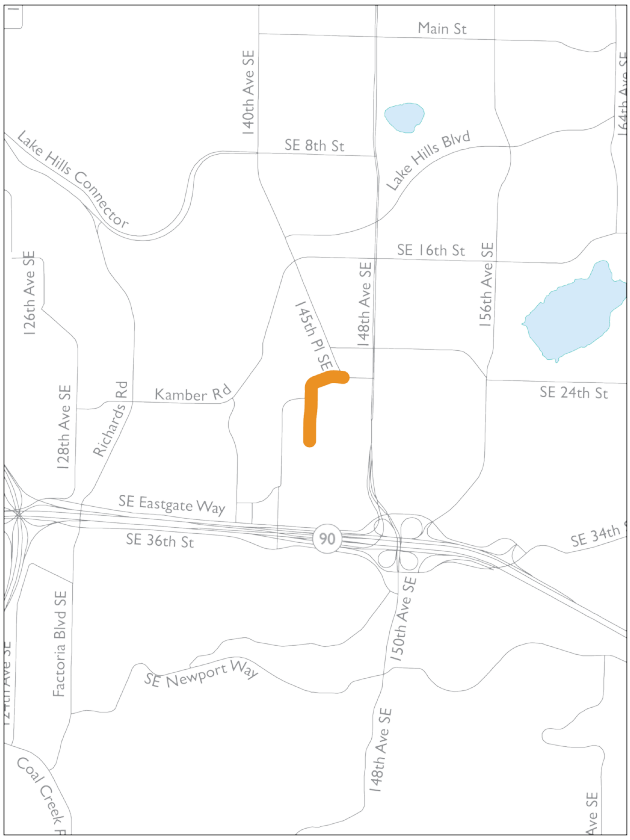


Person Throughput

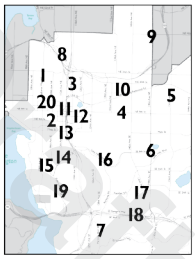


Vehicle Throughput

Bus Auto



17 Kelsey Creek Rd btw 145th Pl SE and Tyee River Rd



Draft

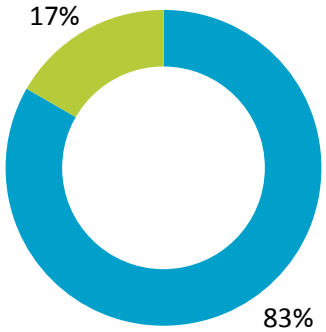
Buses[1]	46
Total Vehicles[1]	276
Percent Transit[1]	17%
Person Trips – Transit[1]	1,350
Person Trips – Total[1]	1,620
Percent Transit[1]	83%

[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

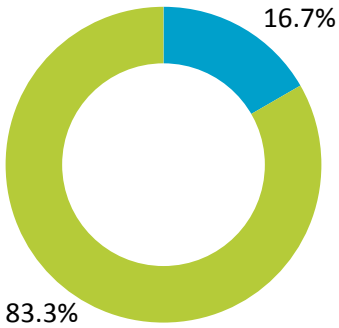
	Weighted Scores[2] Long-Term
Composite Score	12
Weekday Ridership	6
Weekday Bus Volumes	4
Approach Delay (sec)	1
Approach Queue Length (ft)	1
Intersection LOS	0

1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]
2030 PM Peak

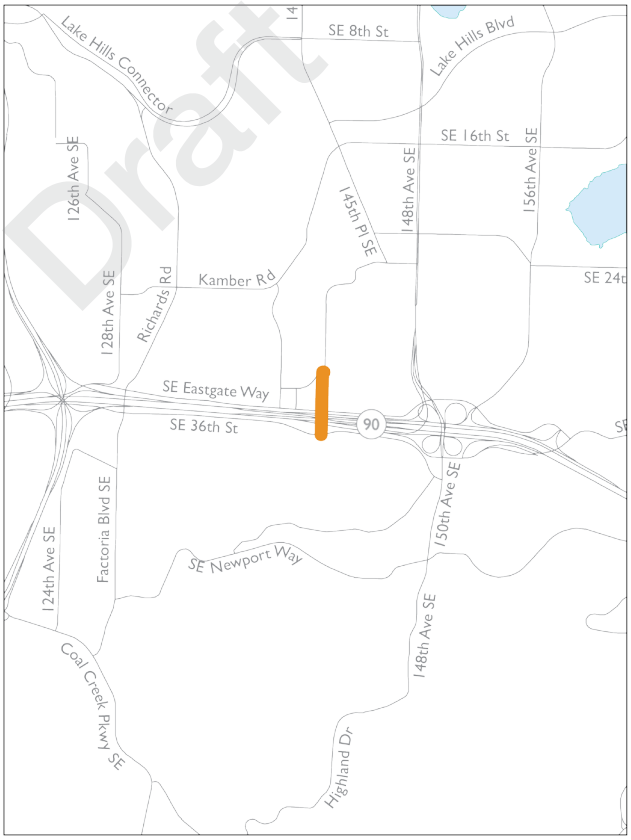


Person Throughput

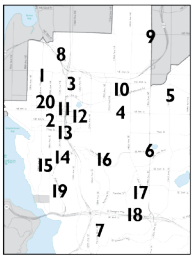


Vehicle Throughput

Bus Auto



18 142nd Pl SE btw Coal Creek Rd and SE 36th St



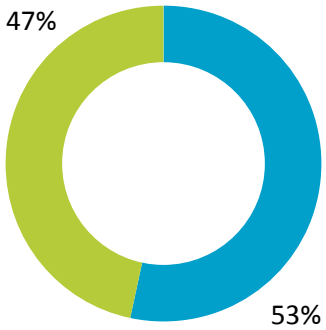
Buses[1]	40
Total Vehicles[1]	625
Percent Transit[1]	6%
Person Trips – Transit[1]	1,025
Person Trips – Total[1]	1,920
Percent Transit[1]	53%

[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

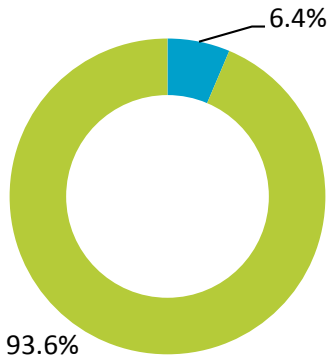
	Weighted Scores[2] Long-Term
Composite Score	15 - 19 (17.0)
Weekday Ridership	0 - 4 (2.0)
Weekday Bus Volumes	3
Approach Delay (sec)	4
Approach Queue Length (ft)	4
Intersection LOS	4

1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]
2030 PM Peak



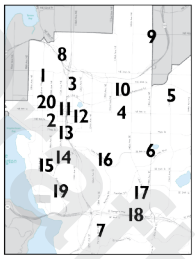
Person Throughput



Vehicle Throughput

Bus Auto

19 Bellevue Way SE btw 113th Ave SE and I-90



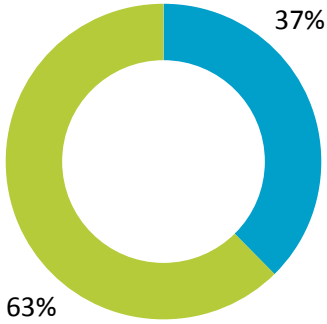
Buses[1]	48
Total Vehicles[1]	4,618
Percent Transit[1]	1%
Person Trips – Transit[1]	3,830
Person Trips – Total[1]	10,330
Percent Transit[1]	37%

[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

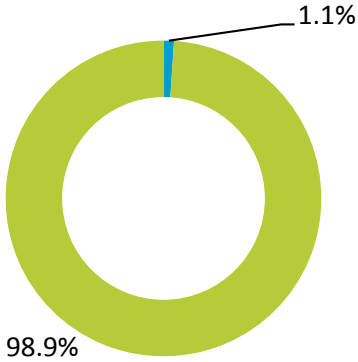
	Weighted Scores[2] Long-Term
Composite Score	22 - 23 (22.7)
Weekday Ridership	8
Weekday Bus Volumes	4
Approach Delay (sec)	2 - 4 (3.0)
Approach Queue Length (ft)	4
Intersection LOS	3 - 4 (3.7)

1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]
2030 PM Peak



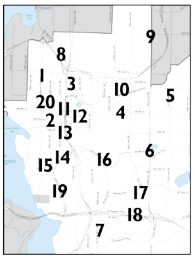
Person Throughput



Vehicle Throughput

Bus Auto

20 NE 10th St btw Bellevue Way NE and 112th Ave NE



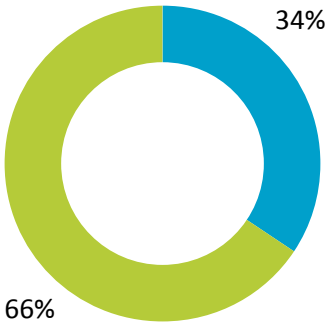
Buses[1]	24
Total Vehicles[1]	2,349
Percent Transit[1]	1%
Person Trips – Transit[1]	1,658
Person Trips – Total[1]	4,823
Percent Transit[1]	34%

[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

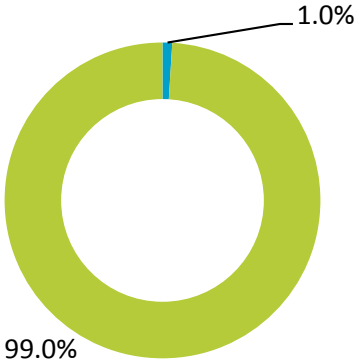
	Weighted Scores[2] Long-Term
Composite Score	17 - 19 (18.0)
Weekday Ridership	6 - 8 (7.0)
Weekday Bus Volumes	1 - 3 (2.3)
Approach Delay (sec)	2 - 4 (3.3)
Approach Queue Length (ft)	2 - 4 (3.3)
Intersection LOS	2 - 3 (2.3)

1. Based on the City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).
2. Derived from Issue Identification Methodology; see the Capital Element Background Report for details.

Projected Travel Demand[1]
2030 PM Peak



Person Throughput



Vehicle Throughput

Bus Auto

APPENDIX D4: BELLEVUE WAY SE TRAFFIC ANALYSIS SUMMARY

Draft

City of Bellevue

Bellevue Way SE Traffic Analysis Summary

January 24, 2013

Numerous analyses of Bellevue Way SE have been conducted during the planning and preliminary engineering stage of the East Link project. Initially, analyses were focused on the effects of the East Link project itself, with a focus on ensuring that the 900+/- stall expansion of the South Bellevue Park and Ride would be adequately mitigated. Subsequently, the City Council expressed an interest in addressing underlying corridor traffic congestion. For the purposes of this summary, the "Project" is defined as the addition of the southbound HOV lane from the "Y" to the South Bellevue Park and Ride Lot.

PM Peak Hour Indicators:

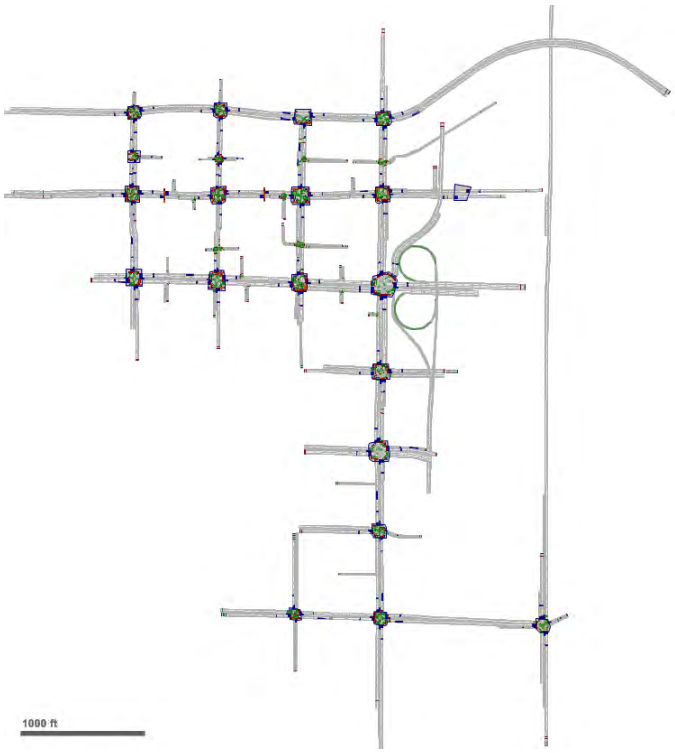
Summary: The Project would substantially reduce transit, HOV, and general purpose travel times while increasing person and vehicle throughput/volumes. At the same time it would reduce neighborhood cut-through traffic. Overall, the Project would result with a more efficient transportation system.

"Y" to Park and Ride	No Build/East Link Mitigated	Project	Change	Percent Change
Travel Time Minutes				
General purpose	3.4	2.0	-1.4	-41%
Transit	3.9	1.4	-2.5	-64%
HOV	3.4	1.2	-2.2	-65%
Volumes				
Bellevue Way SE southbound vehicles	2390	1840 GP 1160 HOV 3000 total	+610	+26%
Transit routes	9	9	0	0
Person trips – total	4440	6030	1590	+36%
Person trips – transit	1520	1690	170	+11%
Person trips – Auto-HOV	2920	1830 + 2510	1420	+49%
Southbound neighborhood vehicle volumes	470 (108th Ave SE) 300 (104th Ave SE) 770 total	210 (108th Ave SE) 190 (104th Ave SE) 400 total	-260 (108th) -110 (104th) -370 total	-55% -37% -48% total
Cost				
	$18-20m (City build independently)	$11m (City share of $22m joint project)		

Belway HOV Summary Table For Council 1-24-13.Docx

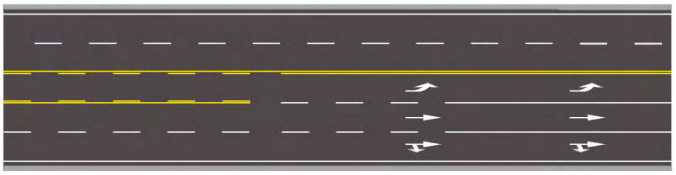
Draft

APPENDIX D5: DOWNTOWN BELLEVUE MICRO-SIMULATION ANALYSIS

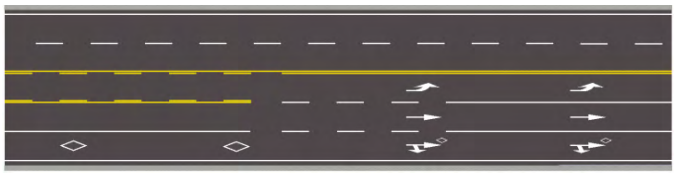


Appendix Figure 18 Downtown Bellevue study area boundaries.

Existing Configuration



Future with Improvement



Appendix Figure 19 Existing configuration of the roadway and the proposed restriping for both NE 10th Street and Main Street.

In the *Draft Speed and Reliability Project List* (November 2013), Bellevue staff brought forward a number of potential arterial High-Occupancy Vehicle (HOV) lane projects for Transportation Commission consideration. These projects are intended to support Bellevue's Frequent Transit Network (FTN) vision of enabling more people to reach more destinations in less time (see the *Transit Service Vision Report*).

At its November 14, 2013 meeting, the Commission requested additional information about Running Way Projects L11 and L13, eastbound HOV lanes between Bellevue Way and 112th Ave NE on Main Street and NE 10th St, respectively. Both projects propose converting an existing general purpose travel lane in the eastbound direction into an HOV lane. This memo summarizes the results of a VISSIM micro-simulation traffic model analysis of these Downtown Bellevue HOV alternatives.

The VISSIM model used in this assessment of potential HOV lanes is based on the platform developed for the Downtown Bellevue Light Rail Alternatives Analysis (see *Documentation Report,* February 2010). VISSIM is a microscopic, time step- and behavior-based simulation developed to model urban traffic and public transit operations. The program can analyze traffic and transit operations under constraints such as lane configuration, traffic composition, traffic signals, and transit stops, thus making it a useful tool for the evaluation of various alternatives based on transportation engineering and planning measures of effectiveness. Appendix Figure 18 shows the Downtown Bellevue study area boundaries considered in this assessment.

Appendix Figure 19 depicts the existing configuration of the roadway and the proposed restriping for both NE 10th St and Main St. As noted, these projects

Draft

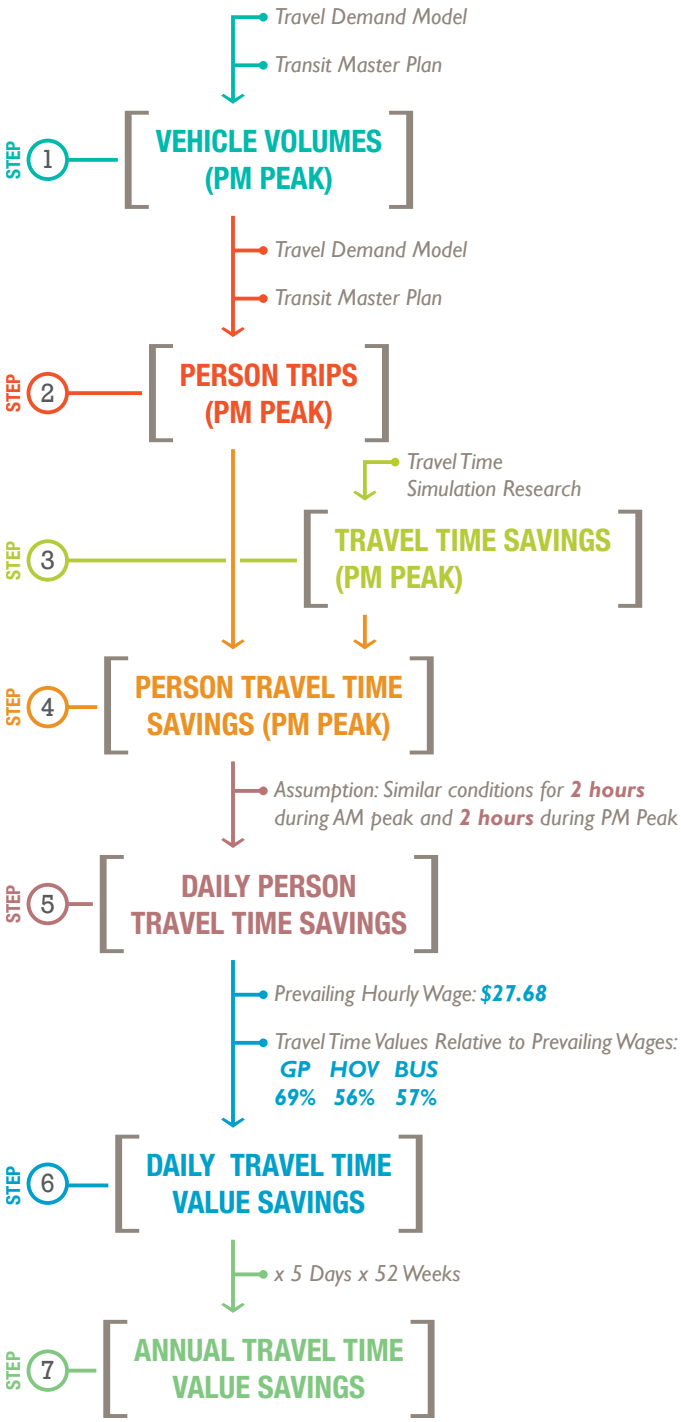
remain within existing street rights-of-way. The HOV lane alternative incorporates Transit Signal Priority (TSP) along NE 10th St at 106th Ave NE, 108th Ave NE, 110th Ave NE, and 112th Ave NE.

Traffic Analysis Methodology

VISSIM was used to assess the 2030 PM peak impacts of the HOV lane alternative on general purpose (GP), high-occupancy vehicle (HOV), and transit (Bus) travel times, as well as measurements of vehicle and person delay. Travel time is one of the largest categories of transport costs, and time savings are often claimed to be the greatest benefit of transport projects like roadway and public transit improvements. Appendix Figure 20 reflects the seven step methodology used for the travel time analysis:

1. Factor inbound volume at 108th Ave NE/ NE 10th St to route volume based on EMME travel demand model output.
2. Factor vehicle volume to person volume based on occupancy rate for each mode.
3. Vehicle travel time difference from baseline to HOV Alternative for each route/mode.
4. Multiply travel time difference with total person for each route/mode.
5. Factor PM Peak-Hour improvement to daily improvement.
6. Factor hourly wages into travel time values for each mode. Multiply person travel time savings with travel time values for each route/mode.
7. Extend travel time savings from daily to annual for each route/mode.

Appendix Figure 20 Seven step traffic analysis methodology.



Draft

Route 1:

From: Bellevue Way NE/NE 10th Street

To: 112th Avenue NE/NE 10th Street

Route 2:

From: Bellevue Way NE/NE 10th Street

To: 108th Avenue NE/NE 8th Street

Route 3:

From: 112th Avenue NE/NE 10th Street

To: Bellevue Way NE/NE 10th Street

Route 4:

From: 112th Avenue NE/NE 10th Street

To: 108th Avenue NE/NE 8th Street

Route 5:

From: 108th Avenue NE/NE 8th Street

To: Bellevue Way NE/NE 10th Street

Route 6:

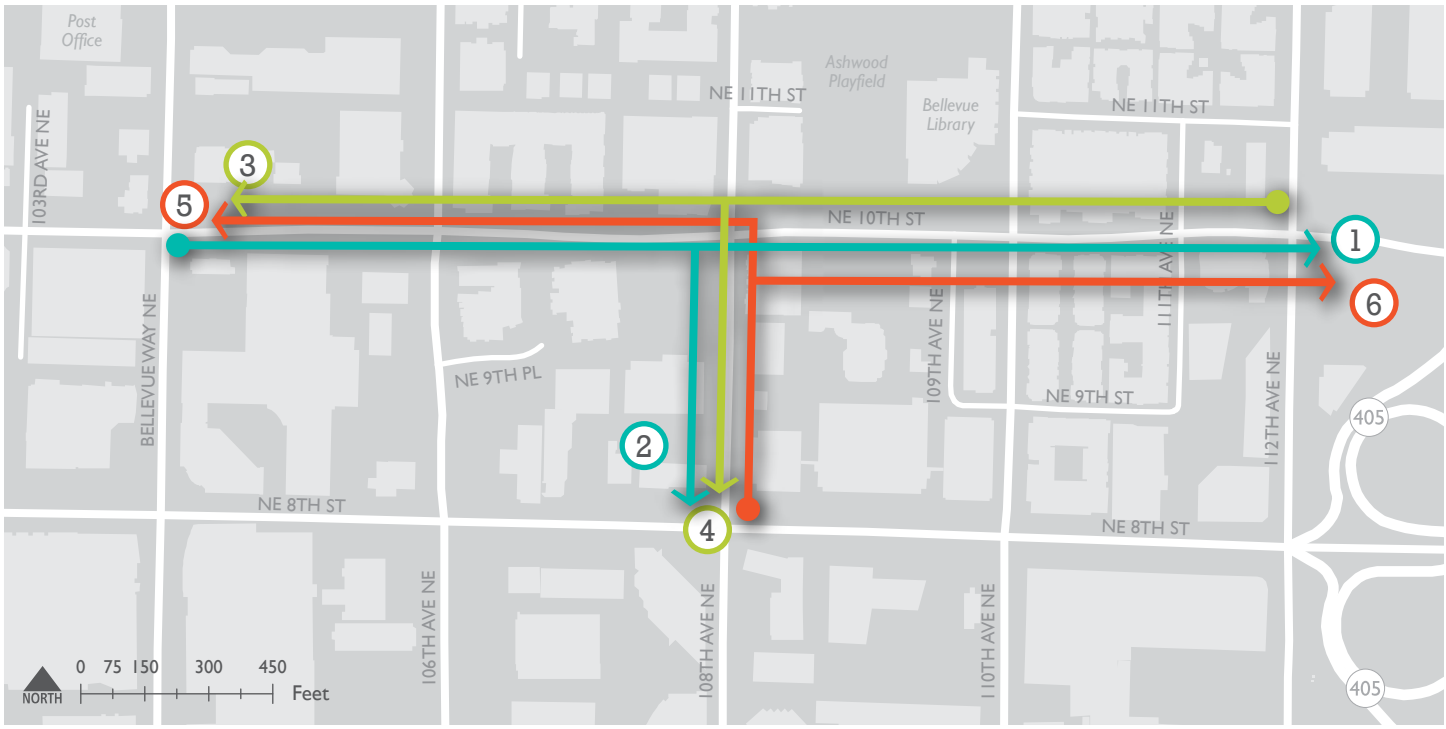
From: 108th Avenue NE/NE 8th Street

To: 112th Avenue NE/NE 10th Street

As indicated, this methodology produces PM peak vehicle travel time (in seconds) and person travel time (in hours) statistics by mode (GP, HOV, and Bus). Daily person travel time savings figures are derived from these statistics and then monetized based on the average hourly wage of workers in the Seattle-Bellevue-Everett Metropolitan Division (Source: *Bureau of Labor Statistics*, May 2012). The valuation of time is cross-referenced with adjustment factors to reflect qualitative factors such as comfort, convenience, and reliability using Level-of-Service ratings for various modes (Source: *Victoria Transport Policy Institute*, see page 5.2-10). The final step of the analysis annualizes the value of daily travel time savings.

The analysis methodology for the NE 10th St improvements considers the travel time impact on general purpose (GP), high-occupancy vehicle (HOV), and transit (Bus) for the six different routes to/from and along NE 10th Street described at left (see Appendix Figure 21).

Appendix Figure 21 Six routes to/from and along NE 10th Street.



NE 10th Street Analysis Results

Appendix Tables 2 through 9 below and on the following pages provide the results from the analysis methodology for each of the six routes identified for the NE 10th St analysis.

Draft

Appendix Table 16 Routes vehicle volume estimation (PM Peak-Hour) values derived from factoring inbound volumes at 108th Ave NE/NE 10th Street to route volume based on EMME travel demand model output.

From EMME Travel Demand Model						*In Vissim Model*			
Total Inbound Volume @ 108th & 10th		Route	Vol at Start	Vol at the End	Total Vol	Total Inbound Volume @ 108th & 10th		Route	Total Vol
Eastbound	*1,156*	*1*	*728*	*815*	*513*	*Eastbound*	*1,262*	*1*	*560*
		2	*728*	*99*	*62*			*2*	*68*
Westbound	*1,308*	*3*	*936*	*549*	*393*	*Eastbound*	*576*	*3*	*173*
		4	*936*	*355*	*254*			*4*	*112*
Northbound	*849*	*5*	*849*	*79*	*79*	*Northbound*	*574*	*5*	*53*
		6	*849*	*269*	*269*			*6*	*182*

Estimated Volumes per Route per Mode								
Mode Split				Vehicle Volume				
GP	HOV-2	HOV-3+	HV	GP	HOV-2	HOV-3+	HV	BUS
70%	*21%*	*7%*	*2%*	*392*	*118*	*39*	*11*	*—*
70%	*21%*	*7%*	*2%*	*48*	*14*	*5*	*1*	*8*
70%	*21%*	*7%*	*2%*	*121*	*36*	*12*	*3*	*—*
70%	*21%*	*7%*	*2%*	*78*	*23*	*8*	*2*	*8*
70%	*21%*	*7%*	*2%*	*37*	*11*	*4*	*1*	*8*
70%	*21%*	*7%*	*2%*	*127*	*38*	*13*	*4*	*8*

Draft

Appendix Table 17 Routes person volume estimation (PM Peak-Hour) values derived from factoring vehicle volume to person volume based on occupancy rate for each mode.

Benefit - HOV+TSP	*Vehicle Volume*				
Route	**GP**	**HOV-2**	**HOV-3+**	**HV**	**BUS**
1	*392*	*118*	*39*	*11*	*—*
2	*48*	*14*	*5*	*1*	*8*
3	*121*	*36*	*12*	*3*	*—*
4	*78*	*23*	*8*	*2*	*8*
5	*37*	*11*	*4*	*1*	*8*
6	*127*	*38*	*13*	*4*	*8*

Person Volume				
GP	**HOV-2**	**HOV-3+**	**HV**	**BUS**
1	*2*	*3.5*	*2*	*90*

Benefit - HOV+TSP	*Person Volume*				
Route	**GP**	**HOV-2**	**HOV-3+**	**HV**	**BUS**
1	*392*	*236*	*136.5*	*22*	*—*
2	*48*	*28*	*17.5*	*2*	*720*
3	*121*	*72*	*42*	*6*	*—*
4	*78*	*46*	*28*	*4*	*720*
5	*37*	*22*	*14*	*2*	*720*
6	*127*	*76*	*45.5*	*8*	*720*

Draft

Appendix Table 18 Travel time difference (PM Peak-Hour) values based on vehicle travel time difference from baseline to HOV Alternative for each route/mode.

Baseline (Direct output from VISSIM)

Vehicle Travel Time Measurement	TRAVTM(ALL)	TRAVTM(1)	TRAVTM(10)	TRAVTM(12)	TRAVTM(13)	TRAVTM(20)	TRAVTM(31)
1	247.44	247.19	247.02	243.87	259.69	255.18	0
2	209.57	212.15	210.74	213.09	150.77	177.51	215.69
3	139.33	139.91	139.4	136.34	143.86	151.98	0
4	160	165.9	146.94	137.62	141.33	183.46	193.54
5	197.31	200.37	247.33	169.91	320.28	168.08	160.8
6	241.52	243.9	244.08	235.77	235.55	213	248.2

HOV + TSP (Direct output from VISSIM)

Vehicle Travel Time Measurement	TRAVTM(ALL)	TRAVTM(1)	TRAVTM(10)	TRAVTM(12)	TRAVTM(13)	TRAVTM(20)	TRAVTM(31)
1	309.88	343.34	343.48	231.88	236.82	333.93	0
2	245.18	247.69	277.35	228.69	217.47	305.72	188.29
3	142.55	141.21	141.72	144.01	148.82	130.95	0
4	209.9	211.97	200.59	186.23	195.1	109.87	234.45
5	180.19	173.17	216.77	216.95	142.46	70.54	127.4
6	224.9	227.28	230.79	217.1	225.03	214.17	187.67

Vehicle Travel Time Change (in seconds) - TSP+HOV

Route	GP	HOV-2	HOV-3+	HV	BUS
1	96.46	-11.99	-22.87	78.75	0
2	66.61	15.6	66.7	128.21	-27.4
3	2.32	7.67	4.96	-21.03	0
4	53.65	48.61	53.77	-73.59	40.91
5	-30.56	47.04	-177.82	-97.54	-33.4
6	-13.29	-18.67	-10.52	1.17	-60.53

Draft

Appendix Table 19 Person travel time savings (PM Peak-Hour) values derived from multiplying the travel time difference with total person for each route/mode.

Route	GP	HOV-2	HOV-3+	HV	BUS	Total by Route
1	*10.50*	*-0.79*	*-0.87*	*0.48*	*—*	*9.33*
2	*0.89*	*0.12*	*0.32*	*0.07*	*-5.48*	*-4.08*
3	*0.08*	*0.15*	*0.06*	*-0.04*	*—*	*0.25*
4	*1.16*	*0.62*	*0.42*	*-0.08*	*8.18*	*10.30*
5	*-0.31*	*0.29*	*-0.69*	*-0.05*	*-6.68*	*-7.45*
6	*-0.47*	*-0.39*	*-0.13*	*0.00*	*-12.11*	*-13.10*
Total by Mode	**11.85**	**0.00**	**-0.89**	**0.38**	**-16.08**	**-4.74**

Appendix Table 20 Person travel time savings (daily) values derived from factoring PM Peak-Hour improvement to daily improvement.

PM Peak-Hour to Daily Rate

GP	HOV-2	HOV-3+	HV	BUS
4	**4**	**4**	**4**	**4**

*** Assumes 2 hours during PM and same benefitial impact during AM 2 hour period*

Person Travel Time Change (in hours) - TSP+HOV (Daily)

Route	GP	HOV-2	HOV-3+	HV	BUS	Total by Route
1	*42.01*	*-3.14*	*-3.47*	*1.93*	*—*	*37.33*
2	*3.55*	*0.49*	*1.30*	*0.28*	*-21.92*	*-16.30*
3	*0.31*	*0.61*	*0.23*	*-0.14*	*—*	*1.02*
4	*4.65*	*2.48*	*1.67*	*-0.33*	*32.73*	*41.21*
5	*-1.26*	*1.15*	*-2.77*	*-0.22*	*-26.72*	*-29.81*
6	*-1.88*	*-1.58*	*-0.53*	*0.01*	*-48.42*	*-52.40*
Total by Mode	**47.40**	**0.01**	**-3.57**	**1.54**	**-64.34**	**-18.96**

Draft

Appendix Table 21 Travel time values derived from factoring hourly wages into travel time values for each mode.

Average Hourly Wage: $27.68

	GP	HOV-2	HOV-3+	HV	BUS
Relative to Prevailing Wages	*67%*	*57%*	*53%*	*135%*	*57%*
Travel Time Values	*$18.55*	*$15.78*	*$14.67*	*$37.37*	*$15.78*

Appendix Table 22 Total travel time savings (daily) values derived from multiplying travel time savings with travel time values for each route/mode.

Daily Travel Time Savings - TSP+HOV

Route	GP	HOV-2	HOV-3+	HV	BUS	Total by Route
1	*$779.10*	*($49.54)*	*($50.91)*	*$72.12*	*—*	*$750.77*
2	*$65.84*	*$7.73*	*$19.07*	*$10.46*	*($345.84)*	*($242.74)*
3	*$5.75*	*$9.62*	*$3.37*	*($5.23)*	*—*	*$13.52*
4	*$86.24*	*$39.13*	*$24.50*	*($12.33)*	*$516.40*	*$653.93*
5	*($23.37)*	*$18.14*	*($40.64)*	*($8.22)*	*($421.58)*	*($475.66)*
6	*($34.87)*	*($24.93)*	*($7.78)*	*$0.37*	*($763.95)*	*($831.15)*
Total by Mode	**$878.69**	**$0.16**	**($52.37)**	**$57.17**	**($1,014.97)**	**($131.32)**

Appendix Table 23 Total travel time savings (annual) values derived from extending travel time savings from daily to annual for each route/mode.

Workdays per Week: 5
Weeks per Year: 52

Annual Travel Time Savings - TSP+HOV (in thousands)

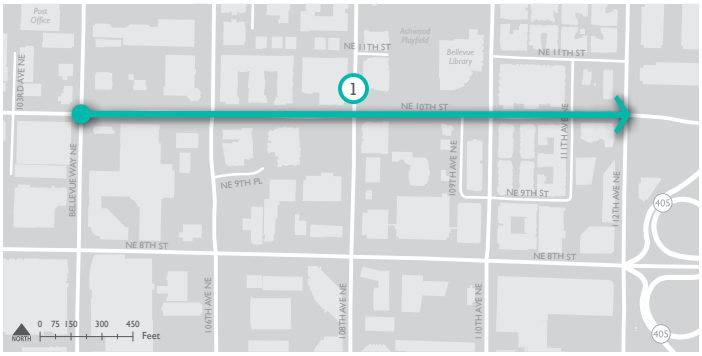
Route	GP	HOV-2	HOV-3+	HV	BUS	Total by Route
1	*$202.57*	*($12.88)*	*($13.24)*	*$18.75*	*—*	*$195.20*
2	*$17.12*	*$2.01*	*$4.96*	*$2.72*	*($89.92)*	*($63.11)*
3	*$1.49*	*$2.50*	*$0.88*	*($1.36)*	*—*	*$3.51*
4	*$22.42*	*$10.17*	*$6.37*	*($3.21)*	*$134.26*	*$170.02*
5	*($6.08)*	*$4.72*	*($10.57)*	*($2.14)*	*($109.61)*	*($123.67)*
6	*($9.07)*	*($6.48)*	*($2.02)*	*$0.10*	*($198.63)*	*($216.10)*
Total by Mode	**$228.46**	**$0.04**	**($13.62)**	**$14.86**	**($263.89)**	**($34.14)**

Draft

NE 10th Street Summary

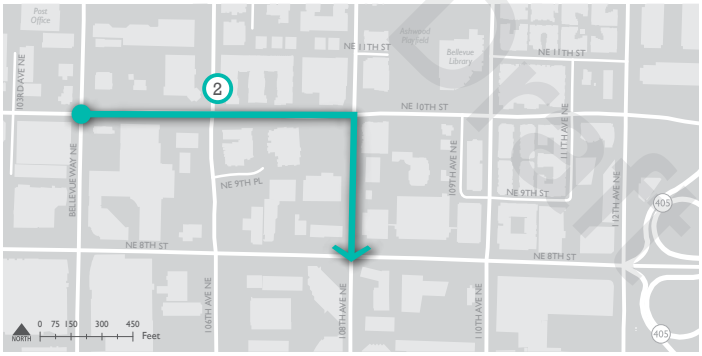
Appendix Figure 22 on page A261 provides a summary of the travel time impact on general purpose (GP), high-occupancy vehicle (HOV), and transit (Bus) for the six different routes to/from and along NE 10th St described above. Some routes experience travel time penalties while others experience travel time benefits. When all of the various routes to/from and along NE 10th St are taken into account, the HOV lane alternative results in an annual travel time savings of $34,140. After considering these impacts at two meetings (on January 22, 2014 and January 23, 2014), the Transportation Commission was in unanimous agreement that these Downtown Bellevue HOV lane projects should remain in the Transit Master Plan for consideration when bus frequencies along these corridors justify this lane conversion.

Appendix Figure 22 Travel time impacts to the six routes to/from and along NE 10th St.



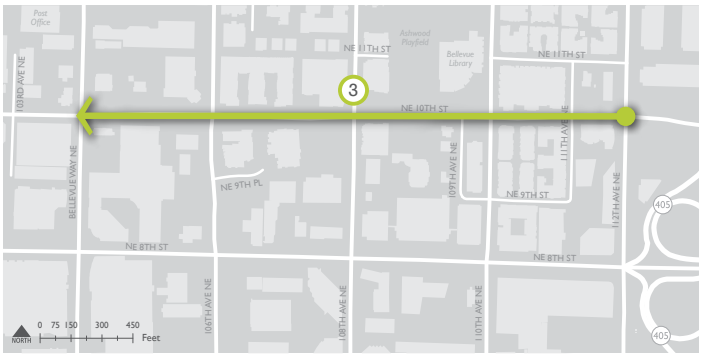
Route 1

Vehicle Travel Time Change (in seconds)			Person Travel Time Change (in hours)			Travel Time Savings (PM Peak)
GP	HOV	BUS	GP	HOV	BUS	$173.56 +19.7%
95.97	-14.71	—	10.98	-1.65	—	



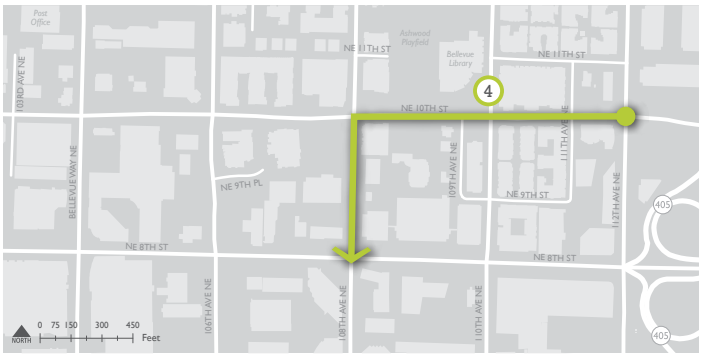
Route 2

Vehicle Travel Time Change (in seconds)			Person Travel Time Change (in hours)			Travel Time Savings (PM Peak)
GP	HOV	BUS	GP	HOV	BUS	$56.10 -7.8%
68.32	28.38	-27.40	0.96	0.44	-5.48	



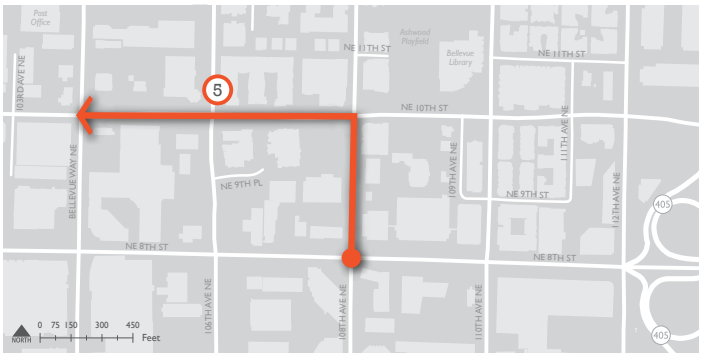
Route 3

Vehicle Travel Time Change (in seconds)			Person Travel Time Change (in hours)			Travel Time Savings (PM Peak)
GP	HOV	BUS	GP	HOV	BUS	$3.15 +2.1%
1.67	6.99	—	0.04	0.21	—	



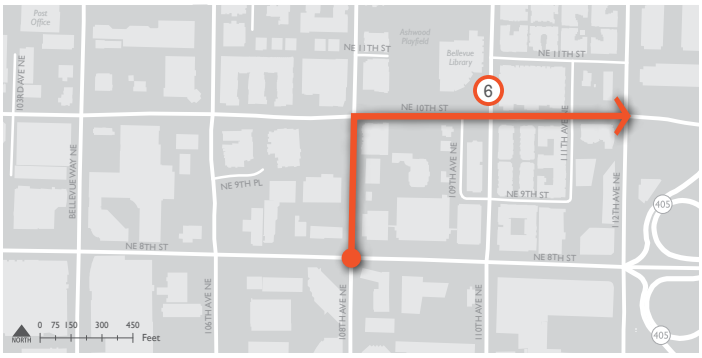
Route 4

Vehicle Travel Time Change (in seconds)			Person Travel Time Change (in hours)			Travel Time Savings (PM Peak)
GP	HOV	BUS	GP	HOV	BUS	$151.24 +22.7%
50.12	49.90	40.91	1.08	1.04	8.18	



Route 5

Vehicle Travel Time Change (in seconds)			Person Travel Time Change (in hours)			Travel Time Savings (PM Peak)
GP	HOV	BUS	GP	HOV	BUS	$109.92 -20.1%
-32.42	-9.18	-33.40	-0.36	-0.40	-6.68	



Route 6

Vehicle Travel Time Change (in seconds)			Person Travel Time Change (in hours)			Travel Time Savings (PM Peak)
GP	HOV	BUS	GP	HOV	BUS	$192.16 -19.2%
-12.89	-16.63	-60.53	-0.47	-0.52	-12.11	

Draft

Main Street Analysis

The improvement evaluated at the Main Street/112th Avenue intersection included the conversion of the eastbound general purpose curb lane to an HOV lane (Project L11) and the widening of Main Street to provide a dedicated eastbound right-turn lane. The analysis assumed that right-turns for general purpose traffic would be permitted from the HOV lane.

Similar to the analysis of NE 10th St, the impacts of the Main St project were also measured using VISSIM. The VISSIM model used for this analysis is consistent with that described for the NE 10th St; however, unlike the analysis of the NE 10th project, this analysis focused on intersection delay, both from a vehicle perspective and person delay perspective. Since this improvement is limited to the subject intersection only, the analysis focuses primarily on the intersection operations. The impact of the use restriction of the curb lane is reflected in the intersection operations summary, the results of which are shown in Appendix Table 24.

Appendix Table 24 Impacts to vehicle and person delay at Main Street/112th Ave NE resulting from Running Way Project L11.

Main St / 112th Ave NE	Baseline		HOV + TSP	
	LOS	Delay (sec)	LOS	Delay (sec)
Vehicle Delay	E	62.0	D	54.5
Person Delay	E	66.8	D	53.7

Assumed Vehicle Occupancy:

SOV: 1

Buses: 90

Main Street Summary

The analysis shows that the average vehicle delay at the intersection is reduced from 62.0 seconds to 54.5 seconds, and person delay is reduced from 66.8 seconds to 53.7 seconds with the improvement. Although the curb lane is restricted to HOV traffic, the right-turn lane provides additional intersection capacity that results in the improvements in both vehicle and personal delay shown in Appendix Table 24. As part of the next level of analysis, further evaluation of the length of the right turn lane and its impact on the corridor performance should be conducted.

APPENDIX D6: BROUCHURE FOR THE BELLEVUE COLLEGE CONNECTION –

142ND PL SE / SNOQUALMIE RIVER RD MULTIMODAL TRANSPORTATION CORRIDOR

Draft

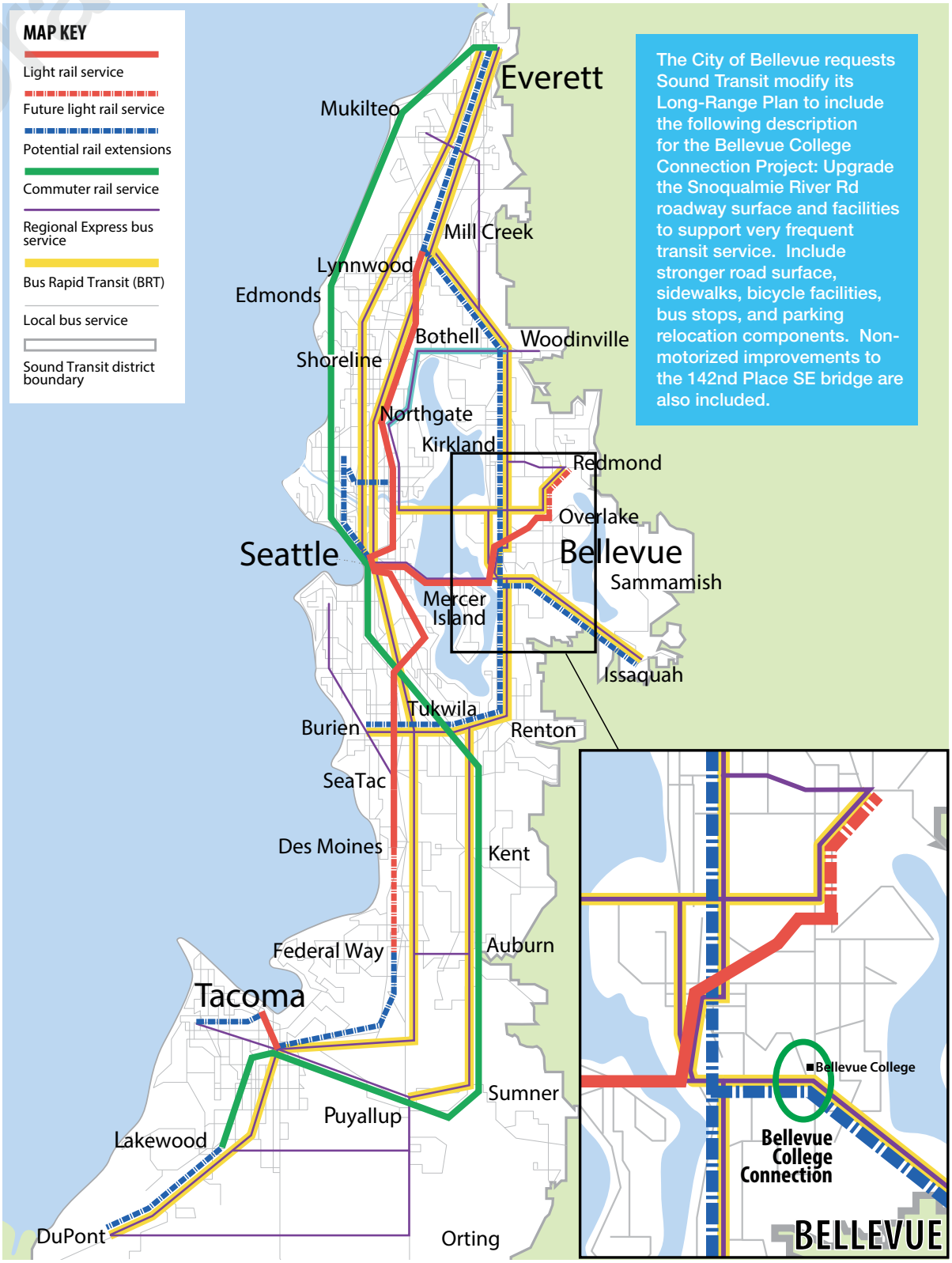
Bellevue College Connection

142nd Place SE/
Snoqualmie River Rd

Multimodal Transportation Corridor

CITY OF BELLEVUE WASHINGTON

Draft



2 **Bellevue College Connection** 142nd Place SE/Snoqualmie River Rd Multimodal Transportation Corridor

Draft

Overview

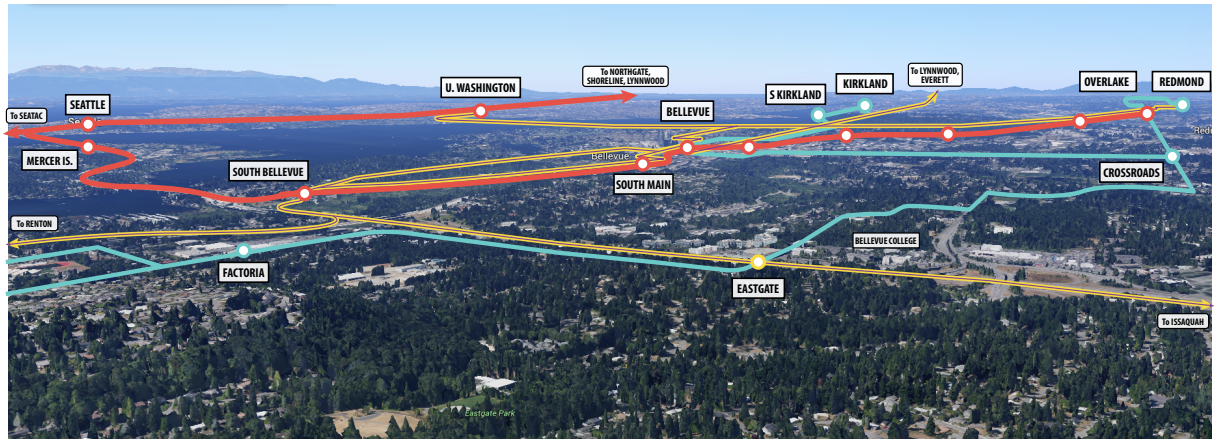
Effective transit can make a community more livable, more accessible, more sustainable, and enhance local quality of life. When complete, the **Bellevue College Connection Project** will combine regional and local transit enhancements with pedestrian, bicycle, and trail infrastructure improvements and private and non-profit investments to dramatically improve mobility options and spur redevelopment along the I-90 corridor.

Project Benefits

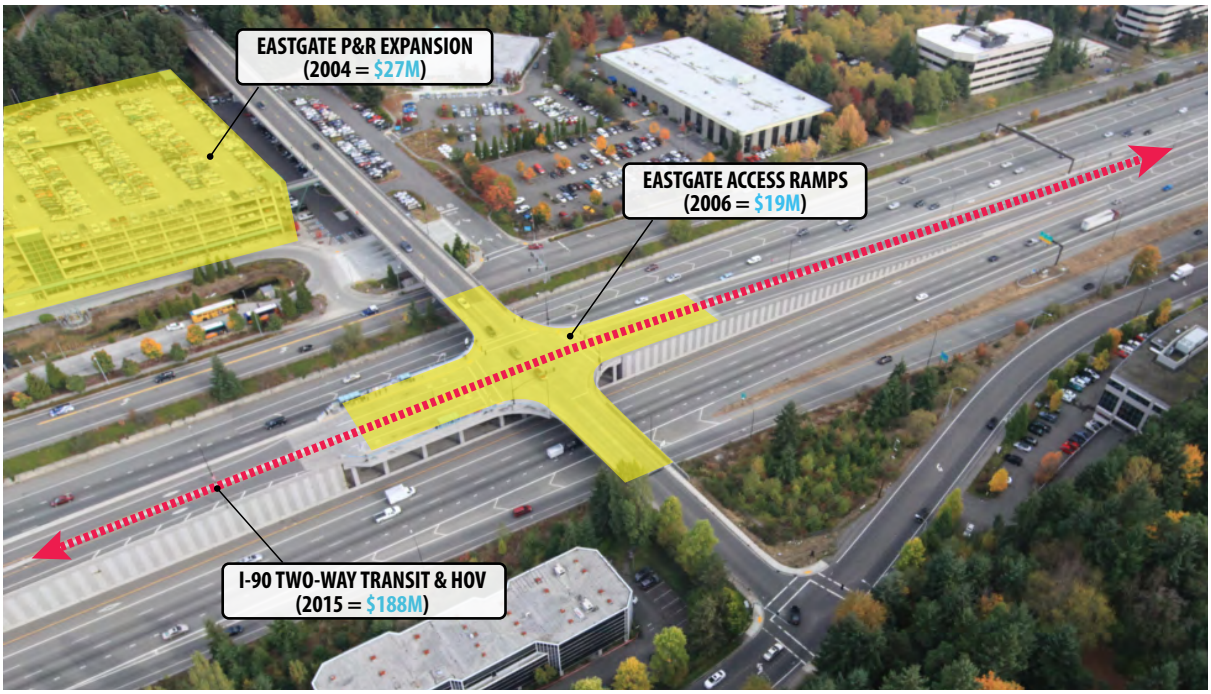
Supporting the all-day transit market. Frequent transit service depends on transit-supportive land use to remain viable, and more compact urban neighborhoods depend on transit to be livable. Bellevue College is a major asset not only for the I-90 corridor but for the regional transit network as a whole. With some 36,000 students enrolled annually, Bellevue College is the third largest higher education institution in Washington State serving a continually growing demand for higher education. Transit is the primary mode of travel for 30% of students commuting to campus, up 10% from 2010. The Bellevue College Connection project supports both the campus' evolution, including planned international housing on campus, and connections for commuters to major employers in the area, including T-Mobile and Expedia, among others.

Draft

Enhancing regional connections.
The Bellevue College Connection project will significantly improve mobility along the north-south High Capacity Transit (HCT) corridor through East Bellevue between two major Bellevue hubs: Eastgate and Crossroads. This would more directly connect Eastgate and Bellevue College to the broader regional transit network.



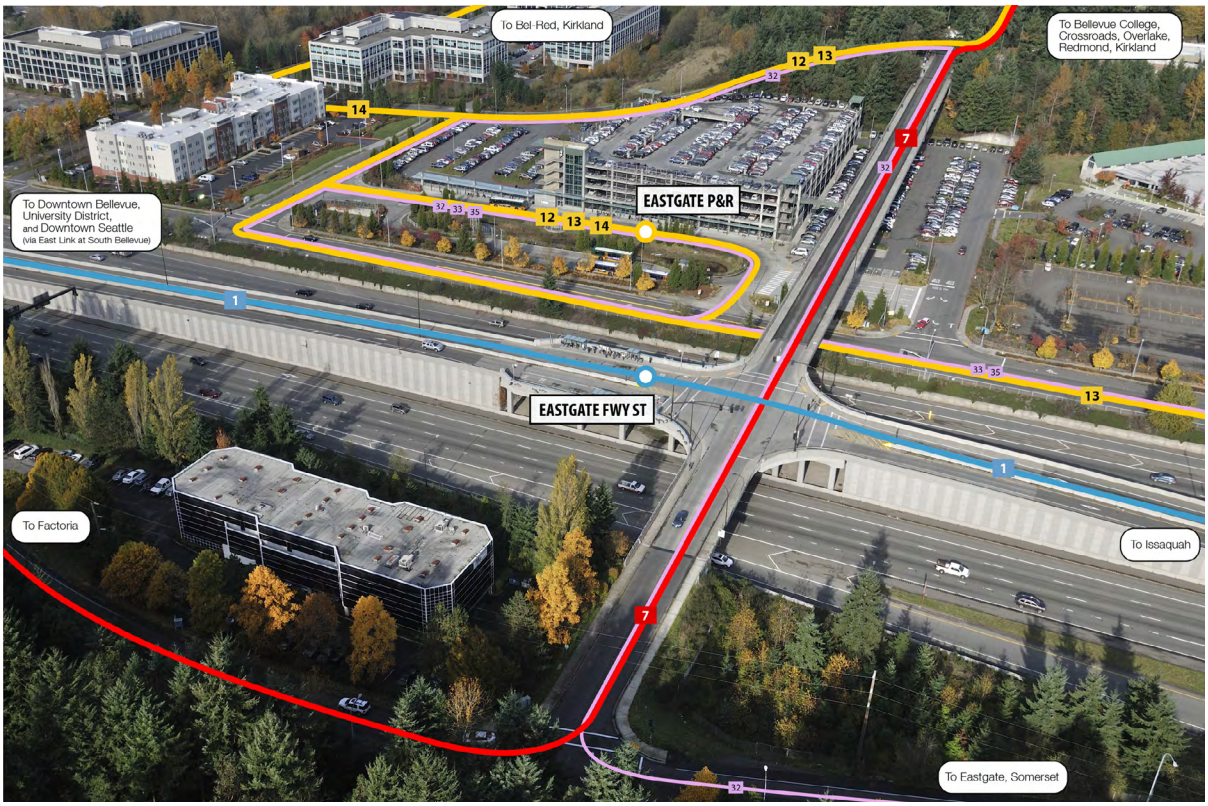
Leveraging existing transit investments.
The Bellevue College Connection maximizes the return on investment of existing and anticipated public transportation projects in the I-90 corridor by coordinating with local and regional transit efforts to identify the types of service and capital features required to meet Bellevue's future mobility needs.



4 **Bellevue College Connection** 142nd Place SE/Snoqualmie River Rd Multimodal Transportation Corridor

Draft

Improving transit speed and reliability.
Enhancing the transit connection between the Eastgate Park & Ride and Bellevue College – both major transit hubs – and points beyond will significantly improve transit operations and service delivery in the region. At present, the Park & Ride and Bellevue College are less than a half mile apart as the crow flies. Unfortunately, terrain and the road network make this a very difficult connection. Coaches travel out to 148th Avenue and turn onto Eastgate Way; this requires three signalized left turns in the northbound direction, in addition to significant added distance. The Bellevue College Connection project will dramatically improve the average speed of coaches in the Eastgate area, resulting in improved provision of cost-efficient and effective bus transit service and potential for increased ridership.



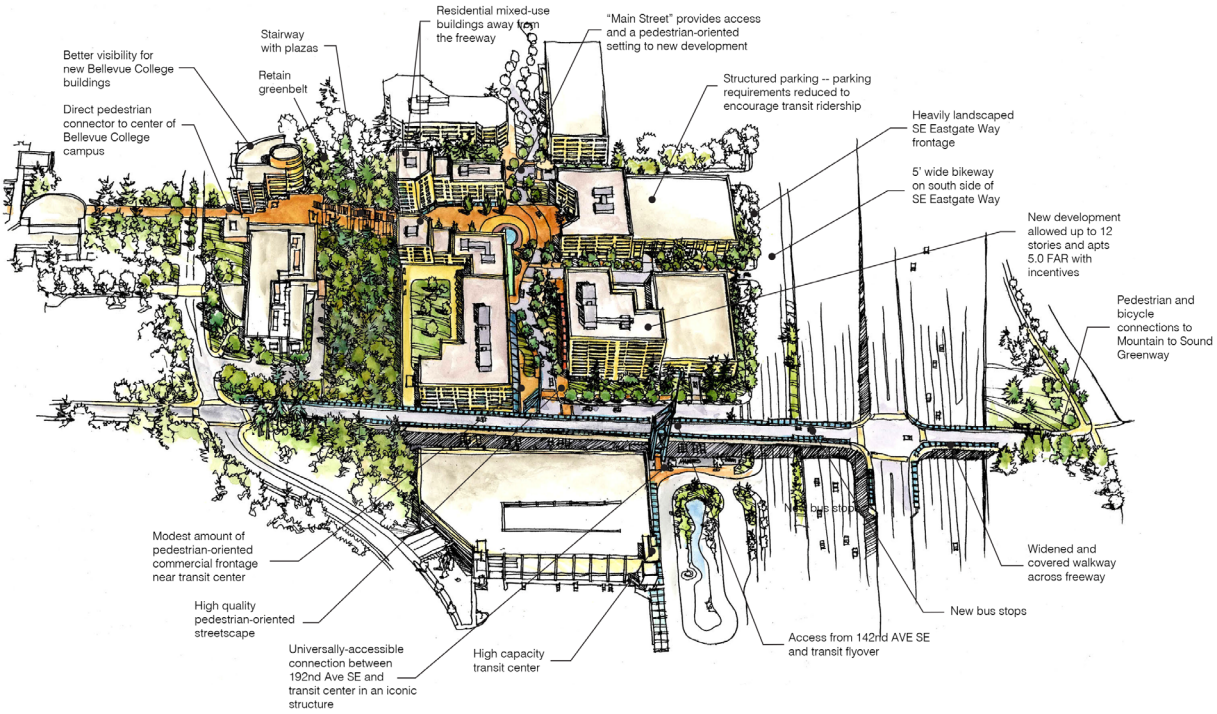
Collaborating with our partners.
Developing a successful transit corridor requires new funding sources, strong partnerships among public agencies, and increased involvement of non-profit and private sector entities. When partnerships coalesce around a project like the Bellevue College Connection, opportunities are realized to enhance connectivity between different modes of transportation and to contribute to a positive community identity. Over the last two years, the City of Bellevue invested in planning, preliminary design, and environmental work for the Bellevue College Connection project. A local match of near-term capital funding is available to advance this priority project.

Draft

Catalyst for Transit Oriented Development.
Over the next 20 years, the I-90 corridor will experience many improvements that will focus, connect, and enhance the region. In Bellevue, the most extensive and focused development will occur around the Eastgate Park & Ride, Bellevue College, Lincoln Executive Center site, and surrounding parcels. The community's goal is to facilitate the evolution of this area into a walkable, bikable, transit-oriented, multiuse center where people work, live, shop, learn, and recreate.
The integration of :

1. the Eastgate Park & Ride,
2. a cluster of mixed-use residential, retail, and office buildings around a new pedestrian-friendly "main street", and
3. a more visually and institutionally prominent Bellevue College

will create a vibrant urban neighborhood supported by a balanced transportation system that emphasizes transit and non-motorized connectivity.

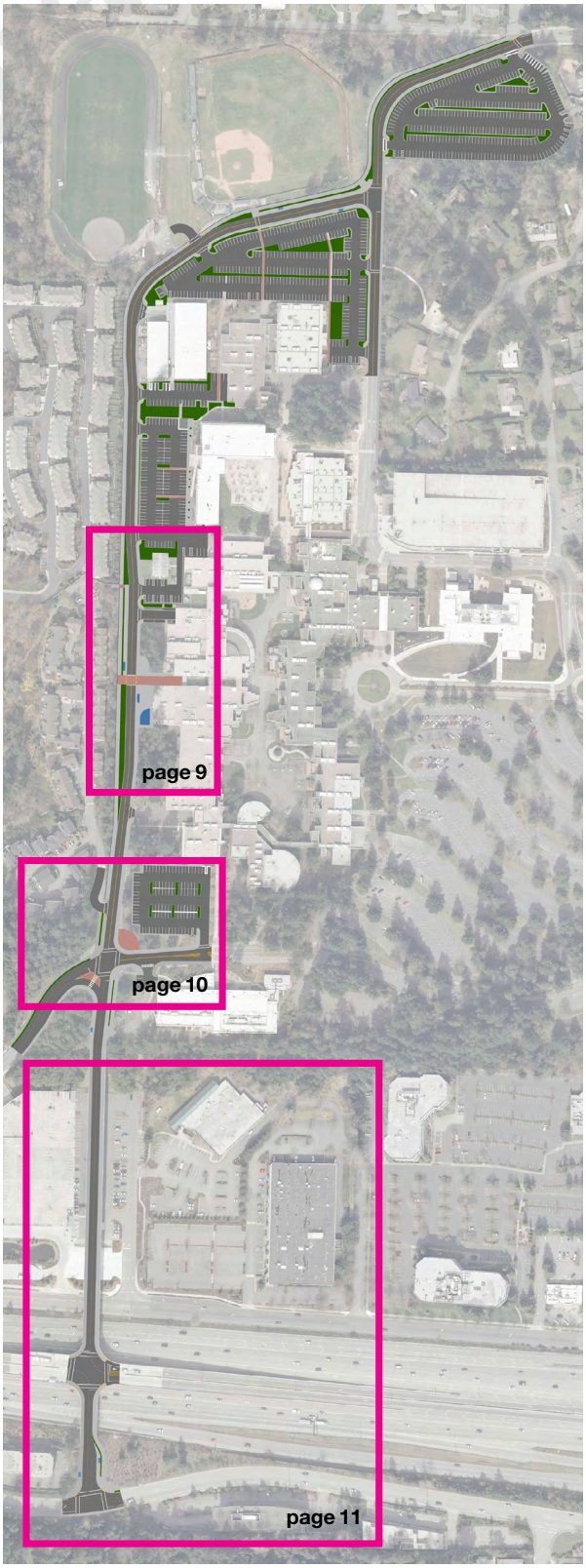


6 **Bellevue College Connection** 142nd Place SE/Snoqualmie River Rd Multimodal Transportation Corridor

Draft

Refining multi-modal connections.
Momentum is building to complete the "Eastgate gap" in the Mountains to Sound Greenway trail – the largest remaining connection linking the Seattle waterfront to Central Washington. The Bellevue College Connection project enhances this facility of statewide significance. Improved walkways and pedestrian cover are added to the 142nd Avenue SE bridge, strengthening the connection between the flyover transit stop, the new main street, and Bellevue College. North of the bridge, improvements would be made on Snoqualmie River Road, which includes upgraded pavement to support buses, sidewalks, accessible bus stops, and the south entrance intersection. Bicycle and walking improvements to Eastgate Way and the MTSG Trail weave the pieces of Eastgate together for non-motorized users. Additional bike routes, sidewalks, and paths throughout the area create a more integrated non-motorized network.

Draft



The **Bellevue College Connection** Multimodal Transportation Corridor is located between the intersection of 142nd Place SE and SE 36th Street on the south end and SE 24th Street and Kelsey Creek Road on the north end. The corridor spans the length of the 142nd Pl SE Bridge from SE 36th St to SE 32nd Street, continues north along Snoqualmie River Road to its intersection with Kelsey Creek Road, and proceeds north to SE 24th Street. This multimodal corridor as proposed and reflected in the preliminary design concepts presented here is intended to support pedestrians, bicyclists, and transit users.

Draft

existing

proposed

Draft

existing

proposed

10 **Bellevue College Connection** 142nd Place SE/Snoqualmie River Rd Multimodal Transportation Corridor

Draft

existing

proposed

Draft

Prepared by:

City of Bellevue
Transportation Department

March 2014

APPENDIX D7: BELLEVUE COLLEGE CONNECTION SEGMENT ANALYSIS

Draft

One of the more significant projects included in this report is the Bellevue College Connection Multimodal Transportation Corridor (Running Way Project L27), which is located between the intersection of 142nd Pl SE and SE 36th St on the south end and SE 24th St and Kelsey Creek Rd on the north end. The corridor spans the length of the 142nd Pl SE Bridge from SE 36th St to SE 32nd St, continues north along Snoqualmie River Rd to its intersection with Kelsey Creek Rd, and proceeds north to SE 24th St (see Appendix Figure 24 on page A276). This multimodal corridor as proposed and reflected in the preliminary designs presented here is intended to support pedestrians, bicyclists, and transit users.

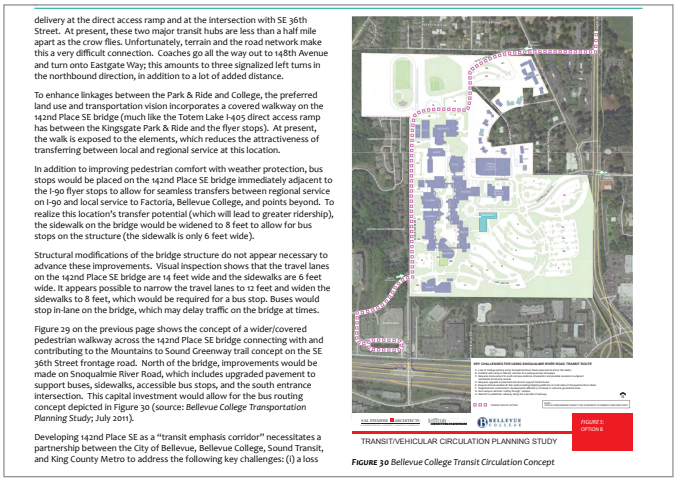
This project was previously highlighted in the *Transportation Strategies Report*, part of the *Eastgate/I-90 Lane Use and Transportation Project* completed in 2012 (see Appendix Figure 23). That report outines a vision that will guide public and private actions, investments, and capital project priorities to improve mobility for all travel modes in the Eastgate/I-90 corridor. Potential improvements advanced by the plan are oriented toward finding the best transportation solutions for the area that are affordable, supported by the community, and can be implemented in a reasonable time frame. The list includes projects that would improve traffic flow at critical intersections, enhance the pedestrian/bicycle environment, and increase the attractiveness of transit as a travel option. One of the transit improvements proposed is the development of 142nd Pl SE as a transit emphasis corridor, including upgrading Snoqualmie River Rd to support buses and accessible bus stops. This project has since been adopted into the *2013-2024 Transportation Facilities Plan* (TFP-252).

Transportation Strategies Report

Eastgate/I-90 Land Use & Transportation Project

CITY OF BELLEVUE
January 2012

Department of Transportation
Department of Planning and Community Development



delivery at the direct access ramp and at the intersection with SE 36th Street. At present, these two major transit hubs are less than a half mile apart as the crow flies. Unfortunately, terrain and the road network make this a very difficult connection. Coaches go all the way out to 148th Avenue and turn onto Eastgate Way; this amounts to three signalized left turns in the northbound direction, in addition to a lot of added distance.

To enhance linkages between the Park & Ride and College, the preferred land use and transportation vision incorporates a covered walkway on the 142nd Place SE bridge (much like the Totem Lake I-405 direct access ramp has between the Kingsgate Park & Ride and the flyer stops). At present, the walk is exposed to the elements, which reduces the attractiveness of transferring between local and regional service at this location.

In addition to improving pedestrian comfort with weather protection, bus stops would be placed on the 142nd Place SE bridge immediately adjacent to the I-90 flyer stops to allow for seamless transfers between regional service on I-90 and local service to Factoria, Bellevue College, and points beyond. To realize this location's transfer potential (which will lead to greater ridership), the sidewalk on the bridge would be widened to 8 feet to allow for bus stops on the structure (the sidewalk is only 6 feet wide).

Structural modifications of the bridge structure do not appear necessary to advance these improvements. Visual inspection shows that the travel lanes on the 142nd Place SE bridge are 14 feet wide and the sidewalks are 6 feet wide. It appears possible to narrow the travel lanes to 12 feet and widen the sidewalks to 8 feet, which would be required for a bus stop. Buses would stop in-lane on the bridge, which may delay traffic on the bridge at times.

Figure 29 on the previous page shows the concept of a wider/covered pedestrian walkway across the 142nd Place SE bridge connecting with and contributing to the Mountains to Sound Greenway trail concept on the SE 36th Street frontage road. North of the bridge, improvements would be made on Snoqualmie River Road, which includes upgraded pavement to support buses, sidewalks, accessible bus stops, and the south entrance intersection. This capital investment would allow for the bus routing concept depicted in Figure 30 (source: *Bellevue College Transportation Planning Study*; July 2011).

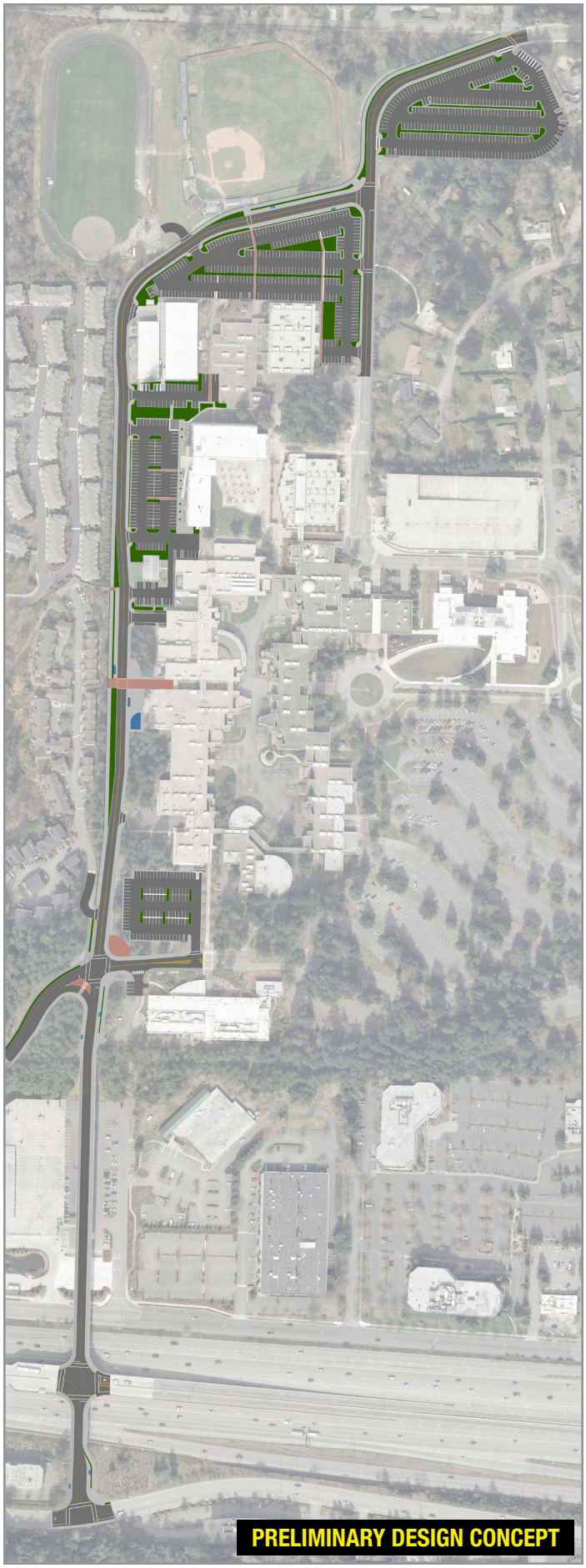
Developing 142nd Place SE as a "transit emphasis corridor" necessitates a partnership between the City of Bellevue, Bellevue College, Sound Transit, and King County Metro to address the following key challenges: (1) a loss

TRANSIT/VEHICULAR CIRCULATION PLANNING STUDY

FIGURE 30 Bellevue College Transit Circulation Concept

Appendix Figure 23 Revised transit routing around Bellevue College along Snoqualmie River Rd, as presented in the *Eastgate/I-90 Transportation Strategies Report*, adopted in January 2012.

Appendix Figure 24 Full extents of the Bellevue College Connection: 142nd Pl SE / Snoqualmie River Rd Multimodal Transportation Corridor.

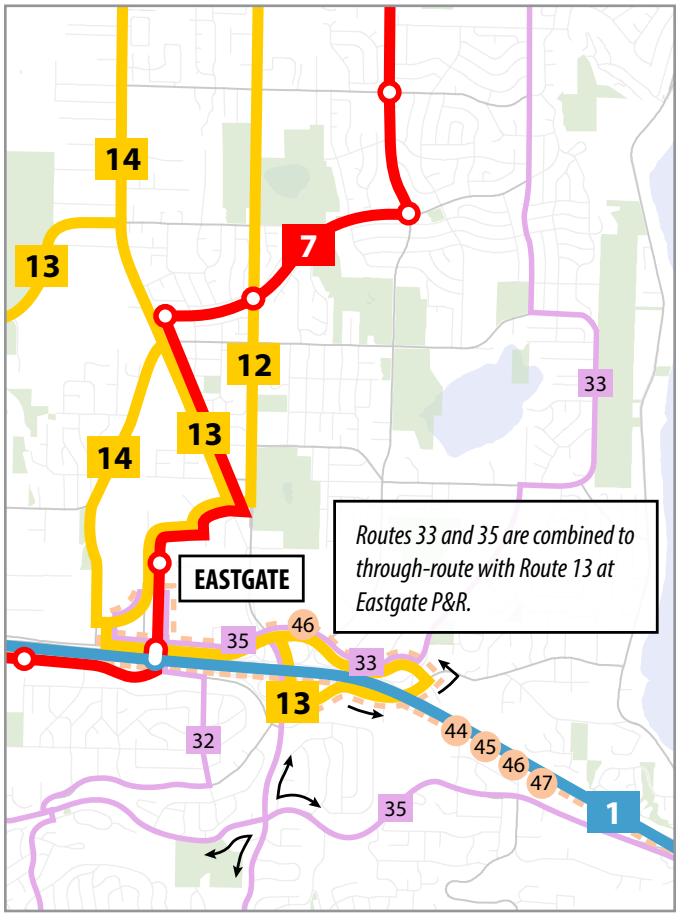


This corridor is especially significant to the Transit Master Plan because it improves the efficiency of transit operations to the Eastgate Park-and-Ride while maintaining direct frequent service to the Bellevue College campus. As described in the *Transit Service Vision Report*, the layout of Bellevue College currently presents a major obstacle to efficient service, and it also creates a conflict between the goal of serving the college well and the goal of providing efficient north-south service connecting Crossroads and Overlake to Eastgate and Factoria. The key is to put Bellevue College "on the way" between Eastgate and Crossroads; currently, Bellevue College is a time-consuming cul-de-sac that discourages all north-south ridership across the eastside of Bellevue. Eastgate will continue to grow more important as a regional connection site, so it must be possible to serve both the campus and Eastgate with a minimal amount of deviation.

As shown in Appendix Figure 25, the 2030 Growing Resources scenario envisions three FTN routes operating along the 142nd Pl SE/Snoqualmie River Rd Multimodal Transportation Corridor: Frequent Rapid Route 7 and Frequent Local Routes 12 and 13. The design of the Bellevue College Connection thus suggests two main types of linear segments along the corridor based on the location of transit, pedestrian, and bicycle traffic flows and the width of travel lanes:

- Snoqualmie River Rd/Kelsey Creek Rd
- 142nd Pl SE Bridge

All three FTN routes traverse the Snoqualmie River Rd/Kelsey Creek Rd segment. At the SE 32nd St intersection, Routes 12FL and 13FL continue southwest to the Eastgate Park-and-Ride, providing connections to Frequent Local Route 14, Coverage Routes 32, 33, and 35, and Peak-Only Route 46. Route 7FR continues south to the Eastgate Freeway Station, providing connections to Frequent Express Route 1, Coverage Route 32, and several Peak-Only routes serving Downtown Seattle and Issaquah (see Appendix Figure 26 on page A279).



WEEKDAY ALL-DAY SERVICE FREQUENCIES (in minutes)

	Peak	Base	Night
Frequent Express	8	10 - 15	30
Frequent Rapid	8	10	15
Frequent Local	8	10	15
Coverage	30	30	30
Peak-Only* (Express & Local)	*Peak frequencies vary by route		

Appendix Figure 25 Routes operating along the 142nd Pl SE/Snoqualmie River Rd Multimodal Transportation Corridor and in Eastgate and vicinity, as proposed by the 2030 Growing Resources scenario in the *Transit Service Vision Report*.

Draft

Draft

Snoqualmie River Rd / Kelsey Creek Rd

Pedestrian flow is logically oriented on the north and east sides of Snoqualmie River Rd around campus structures. A sidewalk is recommended to provide direct access to campus, with widths varying from 6-10 feet depending on the volume of pedestrian flow and the locations of the bus zones. To minimize conflict points between pedestrians and driveways, bicycle traffic is moved west of the road to a 10-foot-wide two-way path, with multiple points of access to the college provided. Two 12-foot-wide travel lanes are provided, one for each direction. General purpose vehicular traffic may be restricted along Snoqualmie River Rd to facilitate better transit operation and access for delivery trucks. A sound wall along Snoqualmie River Rd west of the bicycle facility is designed to minimize noise generated by traffic for the neighboring condominium developments.

142nd Pl SE Bridge

The 142nd Pl SE Bridge currently has two 14-foot-wide travel lanes (one for each direction) and 6-foot-wide sidewalks on both sides. No bicycle facility is provided, making riding over the bridge uncomfortable for most riders. There is significant pedestrian traffic on the west side of the 142nd Pl SE Bridge, mainly to/from the Eastgate Park-and-Ride and Eastgate Freeway Station. Due to pedestrian volumes, an 8-foot-wide sidewalk is recommended on the west side of the road. The east side of the road is identified as a suitable location for an independent bicycle facility, providing a direct connection to the Mountains to Sound Greenway at the northeast corner of SE 36th St and 142nd Pl SE. A 10-foot-wide, two-way, elevated bicycle facility is thus recommended on the east side of the road. These non-motorized facilities leave 22 feet for general purpose travel lanes, which at 11-feet per lane satisfies the minimum width criteria to support transit operations.

Corridor Sub-segments

Within these two main linear segments, multiple sub-segments warrant specific design consideration:

Segment 1: Kelsey Creek Rd/SE 24th St to Kelsey Creek Rd/Snoqualmie River Rd

Segment 2: Snoqualmie River Rd/Kelsey Creek Rd to Delivery Zone

Segment 3: Delivery Zone to Greenhouse

Segment 4: Bellevue College Transit Center on Snoqualmie River Road

Segment 5: 142nd Pl SE/SE 32nd St

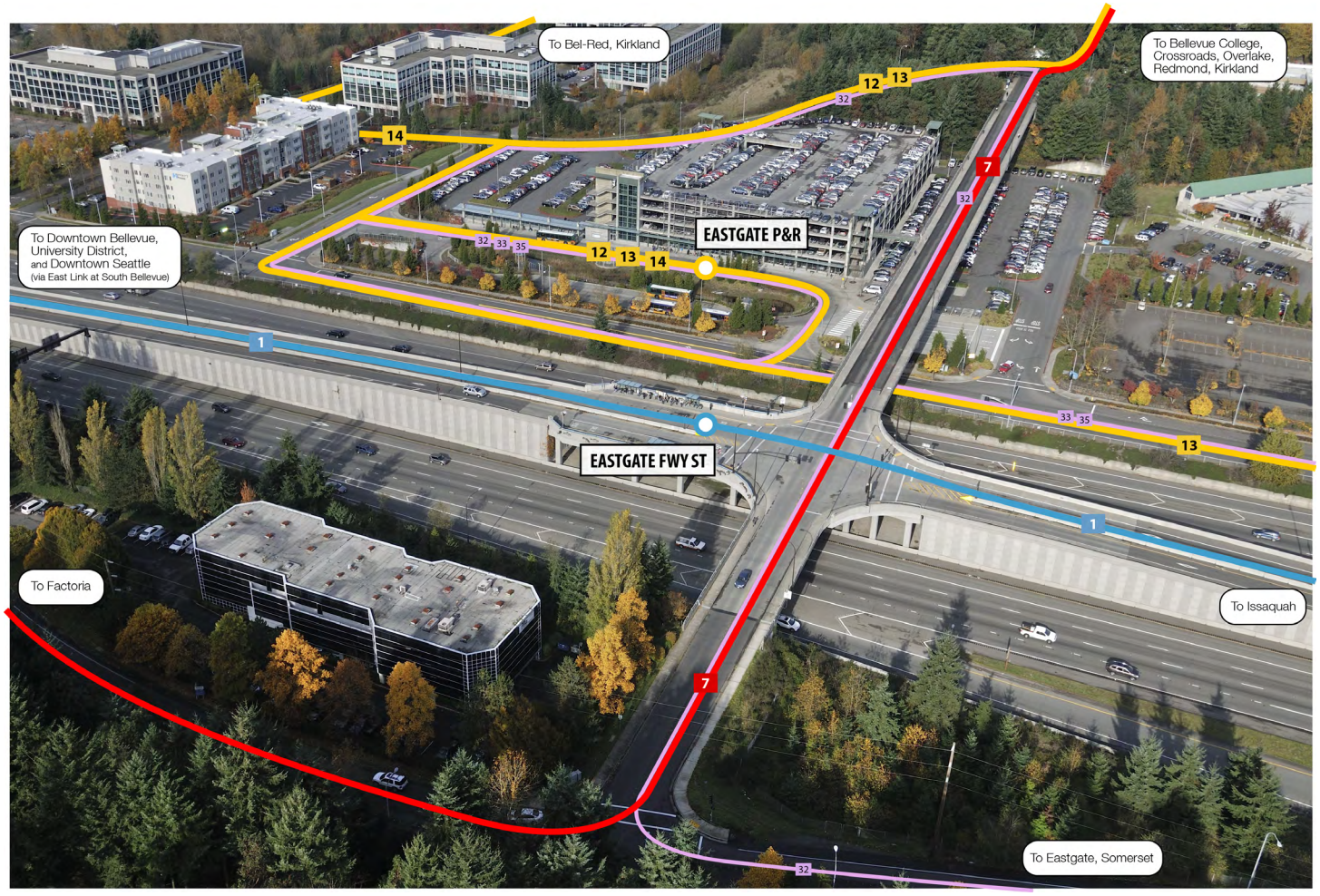
Segment 6: South of 142nd Pl SE/SE 32nd St to 142nd Pl SE north of I-90 Direct Access Ramp

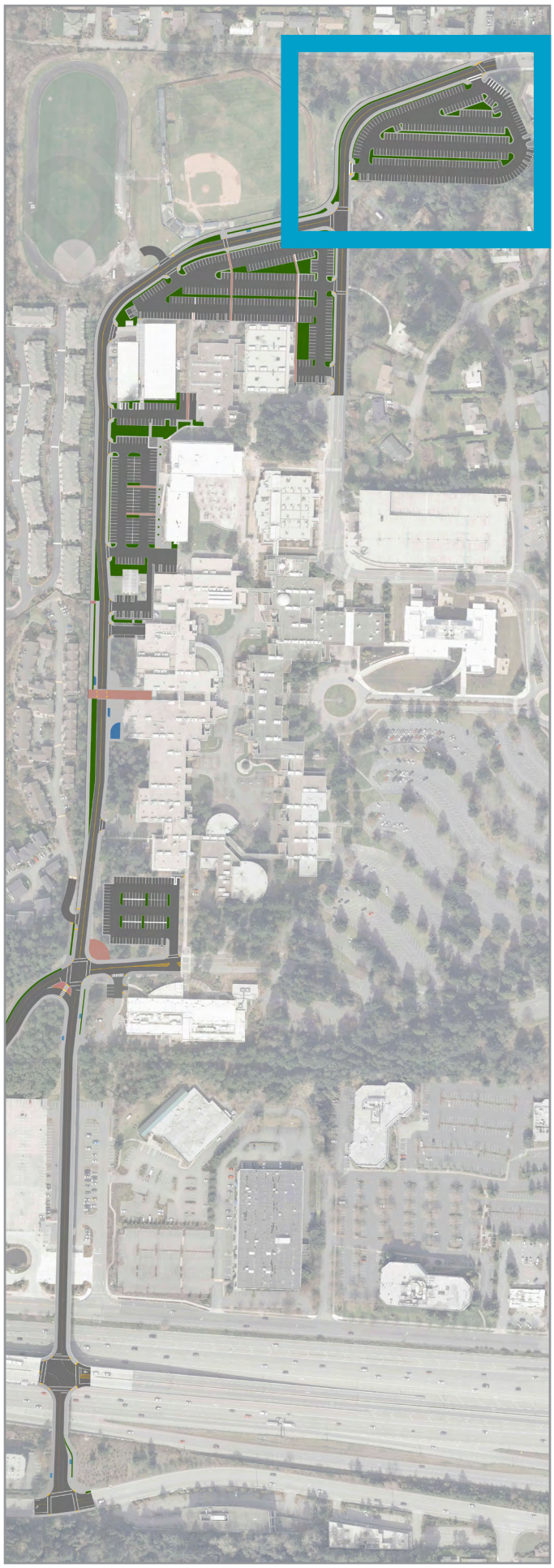
Segment 7: 142nd Pl SE/I-90 Direct Access Ramp to 142nd Pl SE/SE 36th St

Each of these corridor sub-segments is addressed individually on the following pages.

Draft

Appendix Figure 26 Transit services at the Eastgate Park-and-Ride and Eastgate Freeway Station in 2030 based on the Growing Resources network. Frequent connections are available to Bellevue College, Crossroads, Downtown Bellevue, Factoria, Issaquah, Overlake, Redmond, and Kirkland.





Segment 1

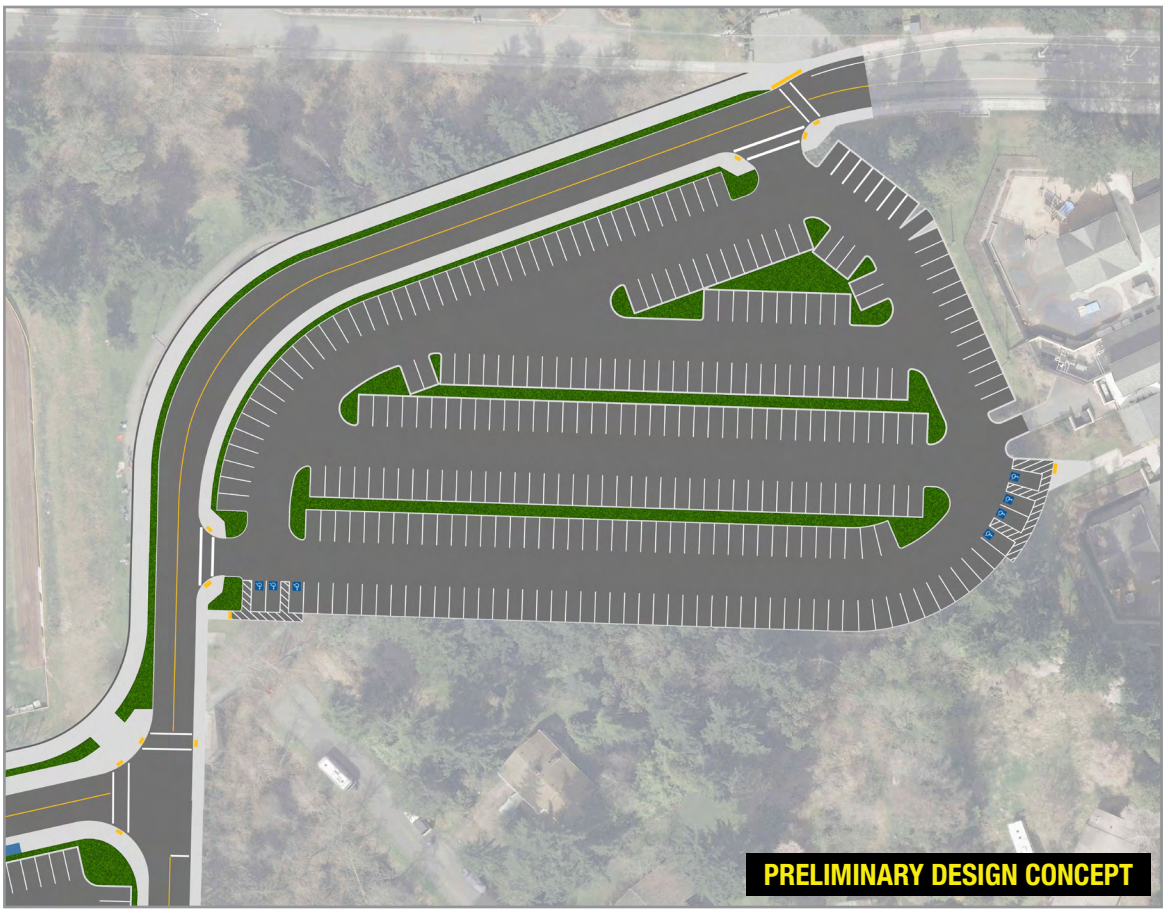
Kelsey Creek Rd/SE 24th St to Kelsey Creek Rd/Snoqualmie River Rd

A 6-foot wide sidewalk is proposed for the south and southeast side of the road. The parking lot is redesigned with only two driveways to reduce the number of the conflict points between pedestrians, transit, and general purpose traffic. The new parking lot design increases the number of stalls by 74, from 227 to 301 stalls (see Appendix Table 25 on page A297).

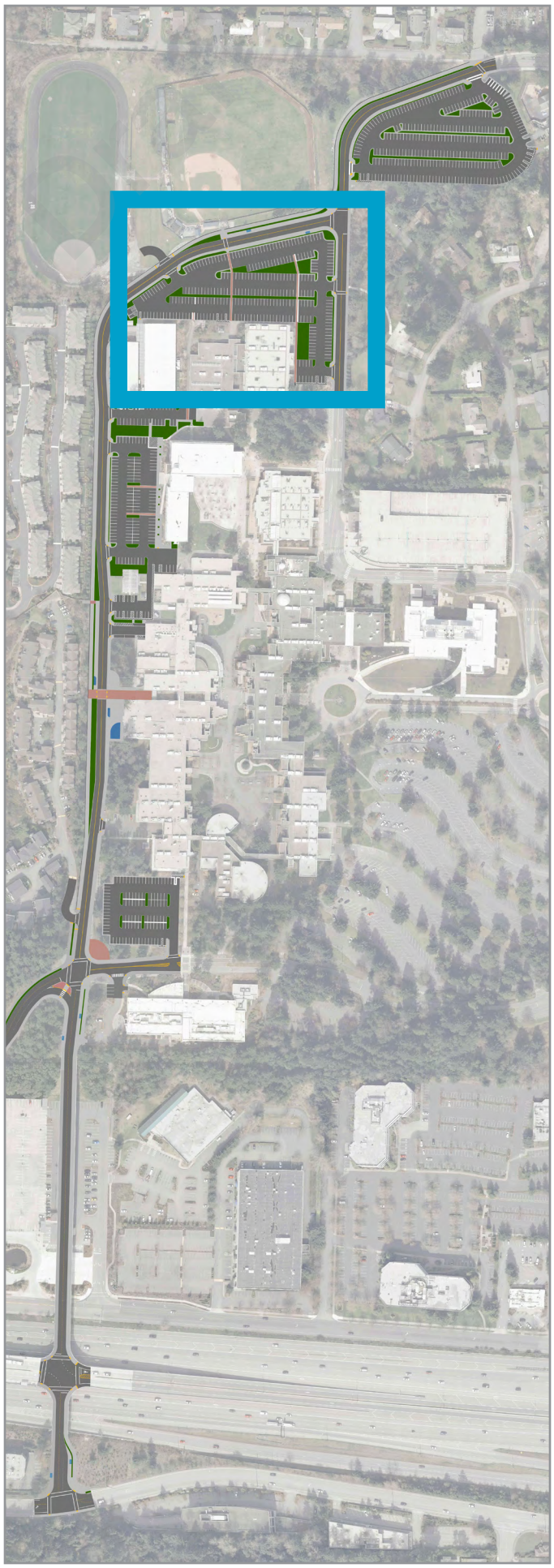
West of the intersection of Kelsey Creek Rd and SE 24th St, a two-way bicycle facility will be constructed on the north side of the road. East of this intersection, bicycle lanes will be provided in the shoulders of both sides of the road. Bicycle users will transition between these facilities at the SE 24th St intersection, such that bicyclists traveling westbound on SE 24th St would continue directly onto the two-way bicycle facility, while those traveling northeastbound from the campus would cross the street from the new bicycle path and continue along SE 24th St on the south side of the road. Bicyclists also have access to campus at the northwest corner of Snoqualmie River Rd and Kelsey Creek Rd.

Existing:

Proposed:



Draft



Segment 2

Snoqualmie River Rd/Kelsey Creek Rd to Delivery Zone

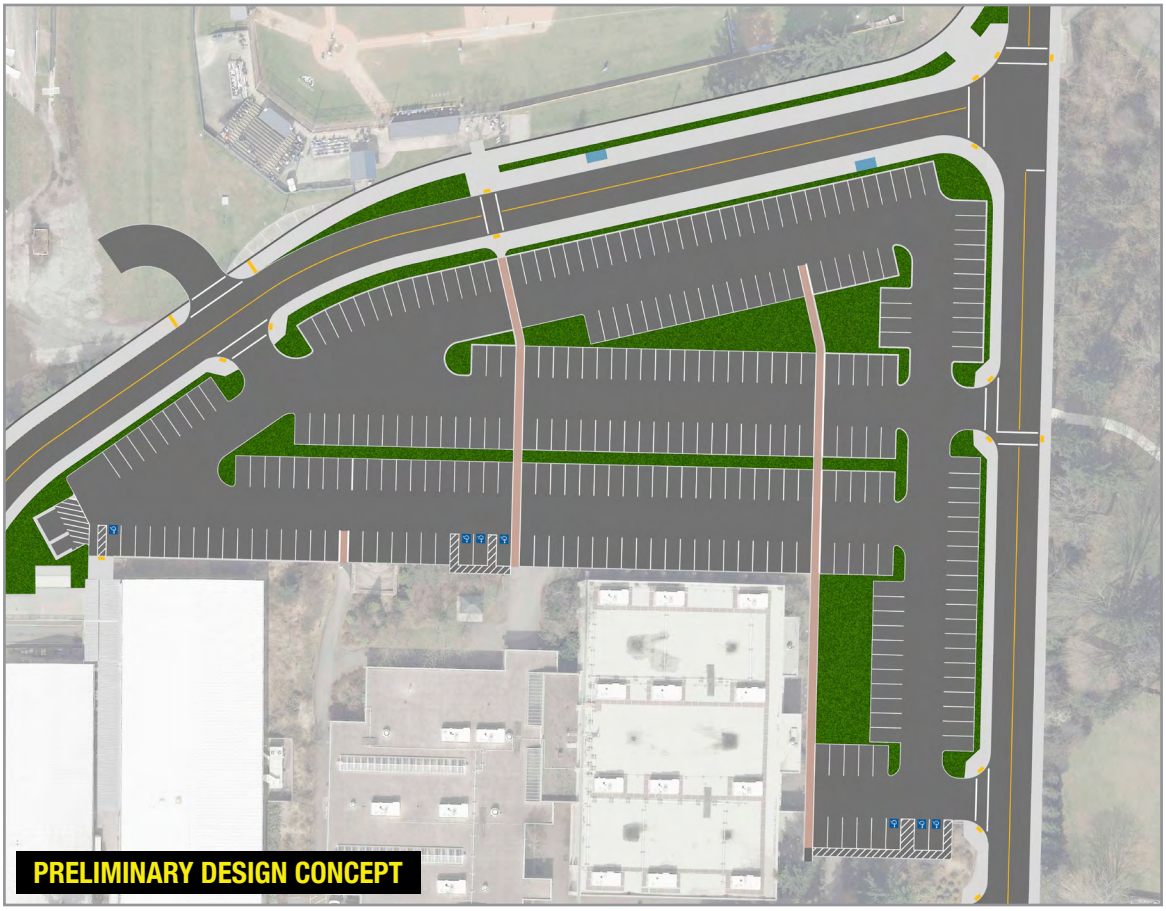
This segment is realigned and shifted north next to the athletic fields to reduce the number of potential conflicts between pedestrians, bicyclists, transit, general purpose traffic, and parking lot users. Parking lot traffic is focused on one side of Kelsey Creek Rd, compared to the current configuration that includes driveways on both sides. This also creates a single parking lot that is larger than the multiple separate existing lots, which allows for a design that maximizes parking capacity. This redesign adds 93 more stalls, increasing the number of stalls in this segment from 203 to 296 (see Appendix Table 25 on page A297).

Another advantage of moving the road north is that it increases the turning radius between Snoqualmie River Rd and Kelsey Creek Rd, which will improve transit operations. Bus zones are located between the intersection of Snoqualmie River Rd/Kelsey Creek Rd and the pedestrian crossing to the athletic fields, as this is the longest distance without driveways or pedestrian crossings (about 300 feet). Ten-foot-wide sidewalks are provided on the north and south sides of Snoqualmie River Rd for the westbound (southbound) and eastbound (northbound) bus zones, respectively.

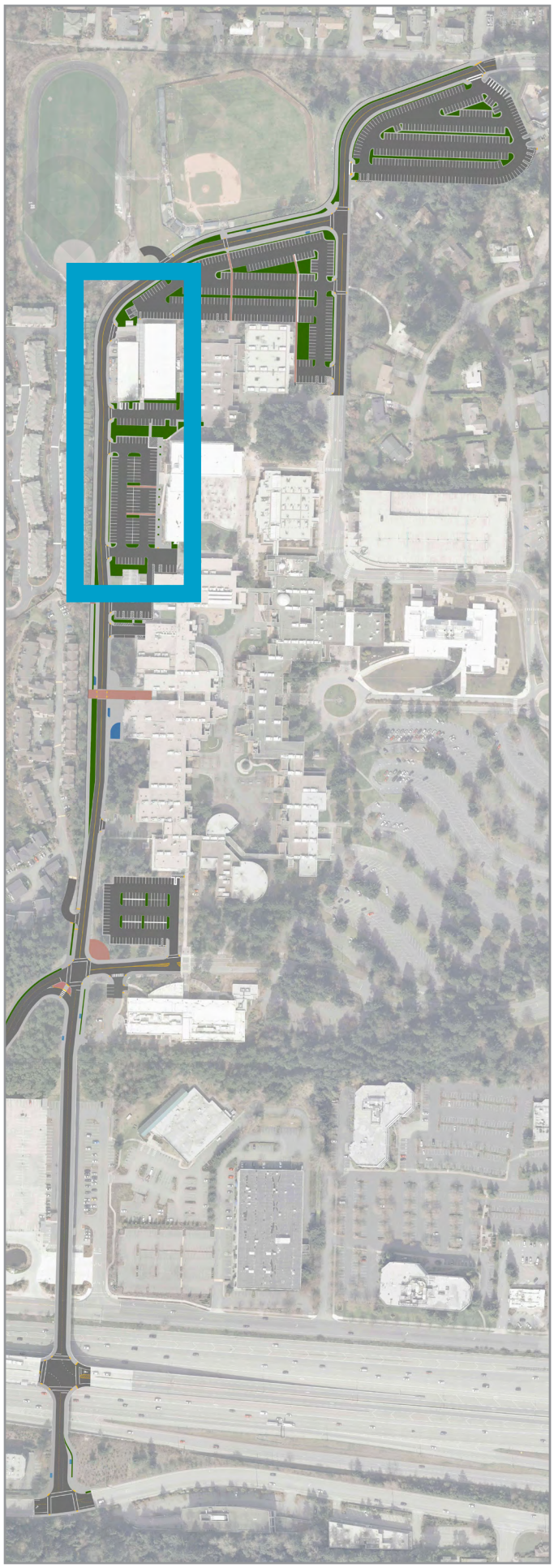
Two pedestrian crossing corridors are provided through the parking lot to facilitate pedestrian movement perpendicular to the parking aisles. Pedestrian access from the gymnasium buildings to the baseball fields remains at almost the same place as its current location. Ideally, to minimize the number of conflicts with bicyclists, it would be combined with the athletic fields' driveway, and the driveway would be moved slightly north from its current location. The bicycle facility is separated from the westbound (southbound) bus zone by a 4-foot-wide planter strip to avoid conflicts with pedestrians. Bicyclists have access to campus and to transit at that bus platform.

Existing:

Proposed:



Draft



Segment 3

Delivery Zone to Greenhouse

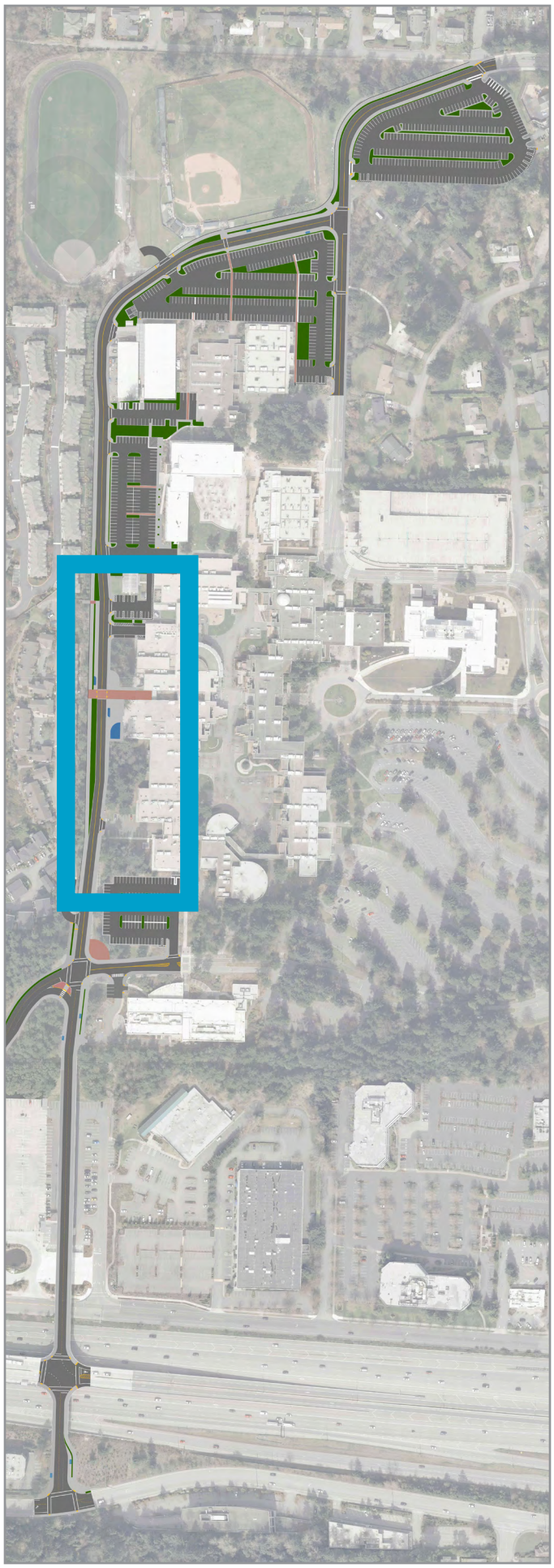
The primary consideration for the Bellevue College delivery zone is preserving the road width to accommodate delivery truck operations. Study of this area resulted in two options for preserving the road width: (1) moving the bicycle facility west of the roadway, or (2) using a mountable curb. While both scenarios have advantages and disadvantages, this design gives preference to the independent bicycle facility west of the roadway. Although this is a more expensive design due to easement and topology, it is much safer and more comfortable for bicyclists, and they would not be required to stop and wait while deliveries take place.

A 6-foot-wide sidewalk provided on the east side of the road, east of the current travel lanes, would be sufficient to support the light pedestrian traffic in this area. Transit vehicles will need to stop and wait for delivery trucks to enter or exit the delivery zone.

With these changes to the roadway and non-motorized facilities, the redesigned parking lot cannot maintain all of the existing stalls in this segment. The number of stalls decreases from 173 to 156, a loss of 17 stalls. However, the parking lot just north of this location (see Segment 2) is close and gains 93 additional stalls, which compensates for the loss realized in this segment (see Appendix Table 25 on page A297).

Existing:

Proposed:



Segment 4

Bellevue College Transit Center on Snoqualmie River Road

This segment includes the primary transit access point to the Bellevue College campus. Bus zones for the Bellevue College Transit Center will be aligned with the campus' main east-west axis, as requested by Bellevue College staff. The pedestrian plaza on the east side of the road may be designed to include a café and magazine kiosk, and a covered area could be provided for tables and chairs.

A 10-foot-wide (minimum requirement) platform area is recommended to accommodate both bus shelters and ADA requirements. Pedestrians cross Snoqualmie River Rd to/from the southbound bus zone at a 24-foot-wide pedestrian crossing area. This design scenario recommends locating bus zones on the near-side of the pedestrian crossing. Although far-side zones would allow buses to leave sooner and reduce dwell times, such a configuration would ultimately encourage unsafe passing, and there are other factors that also support near-side zones. For example, if far-side zones are pursued, two driveways will need to be eliminated—one for the existing handicap parking and one used by delivery trucks. This design preserves the location of the pedestrian access from the neighboring condominium complexes at the north end of the southbound platform. Ideally, it would align with the pedestrian crossing area to reduce the number of conflict points bewteen pedestrians and bicyclists. The bicycle facility west of the southbound zone is separated from the bus platform by a 4-foot-wide planter strip to avoid conflicts with pedestrians. The 24-foot-wide pedestrian crossing extends to the bicycle facility to provide bicyclists access to transit and the campus.

This redesigned roadway eliminates 92 parking stalls along Snoqualmie River Rd (see Appendix Table 25 on page A297). A new parking lot could not be built without significant tree canopy loss.

Existing:

Proposed:

Segment 5

142nd Pl SE/SE 32nd St

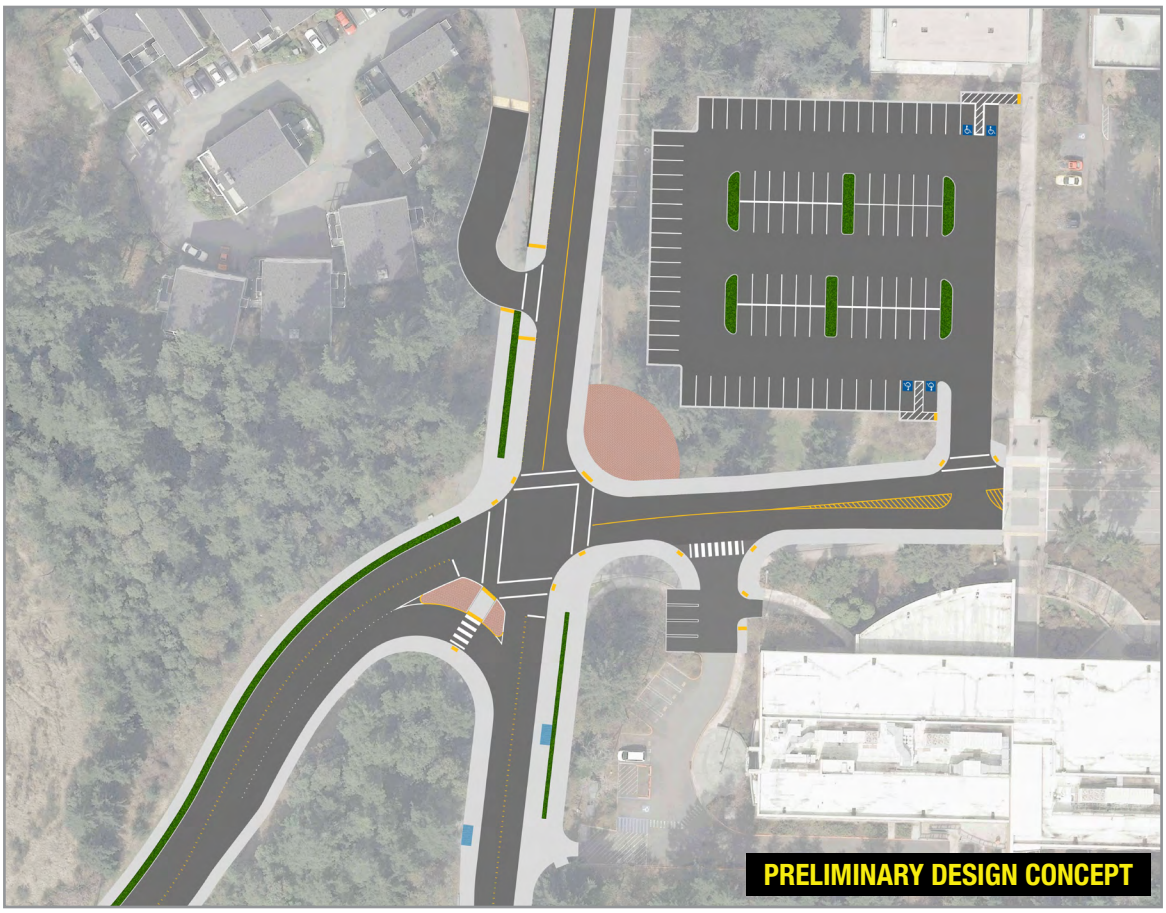
This intersection would undergo significant changes under this preliminary proposed design concept. Currently effectively a five-leg intersection, the realignment of Snoqualmie River Rd would result in a four-leg intersection. Access to the condominium developments along 142nd Pl SE north of SE 32nd St would be provided from Snoqualmie River Rd, instead of directly from the primary intersection. The alignment of Coal Creek Rd would be moved slightly to the north to accommodate a 45-foot turn radius for buses traveling northbound on 142nd Pl SE and continuing westbound on SE 32nd St.

Several bus routes will pass through this intersection, including Routes 7FR, 12FL, and 13FL, and Coverage Route 32. Transit movements will thus consist of north-south travel from 142nd Pl SE to Snoqualmie River Rd (Route 7FR), northbound-to-westbound and eastbound-to-southbound turns between 142nd Pl SE and SE 32nd St (Route 32), and eastbound-to-northbound and southbound-to-westbound turns between SE 32nd St and Snoqualmie River Rd (Routes 12FL and 13FL). The rest of the vehicular traffic consists of private vehicles and delivery trucks to and from the condominium complexes and college campus.

Pedestrian traffic at the intersection comes from Bellevue College (sidewalks on the east side of Snoqualmie River Rd and on the north and south sides of Coal Creek Rd), 142nd Pl SE (sidewalks on the east and west sides of 142nd Pl SE, connecting to the Eastgate Park-and-Ride and northbound bus zone platform), the condominium complex (northwest of the intersection), SE 32nd St, and from the bus zones. Transit shares the road with other traffic west and south of the intersection, but a restriction may be necessary on general purpose traffic along Snoqualmie River Rd north of the condominium complex access road.

Existing:

Proposed:



Draft

Draft

A pair of bus zones already exists on the south leg of the intersection of 142nd Pl SE and SE 32nd St. To better align with the modified intersection, and to facilitate two-door operation, the northbound zone is moved slightly further north. This eliminates transit conflicts with bicyclists using the bicycle facility on the east side of 142nd Pl SE and pedestrians using the pedestrian trail from the lower elevation.

To balance transit access and speed, and to limit the number of potential conflicts between modes, King County Metro recommends only a pair of bus zones on the south leg of the intersection—one for north- and westbound buses and a second for southbound buses. That would mean that buses traveling eastbound on SE 32nd St and continuing northbound on Snoqualmie River Rd (Routes 12FL and 13FL) would not make a stop at the intersection, instead continuing to the Bellevue College Transit Center. Limiting bus zones to only the south leg of the intersection offers more flexibility in addressing access to the condominium complex and the crossing of the bicycle path. The pair of zones on the south leg of 142nd Pl SE can and should remain in-lane stops. Traffic coming from the Bellevue College campus should be minor, as should the LOS for the intersection's west approach. Dwell times are expected to be nominal. King County Metro does not recommend construction of an additional general purpose travel lane. North of the 142nd Pl SE bridge structure, the width of travel lanes would be increased from 11 to 12 feet to facilitate bus operations.

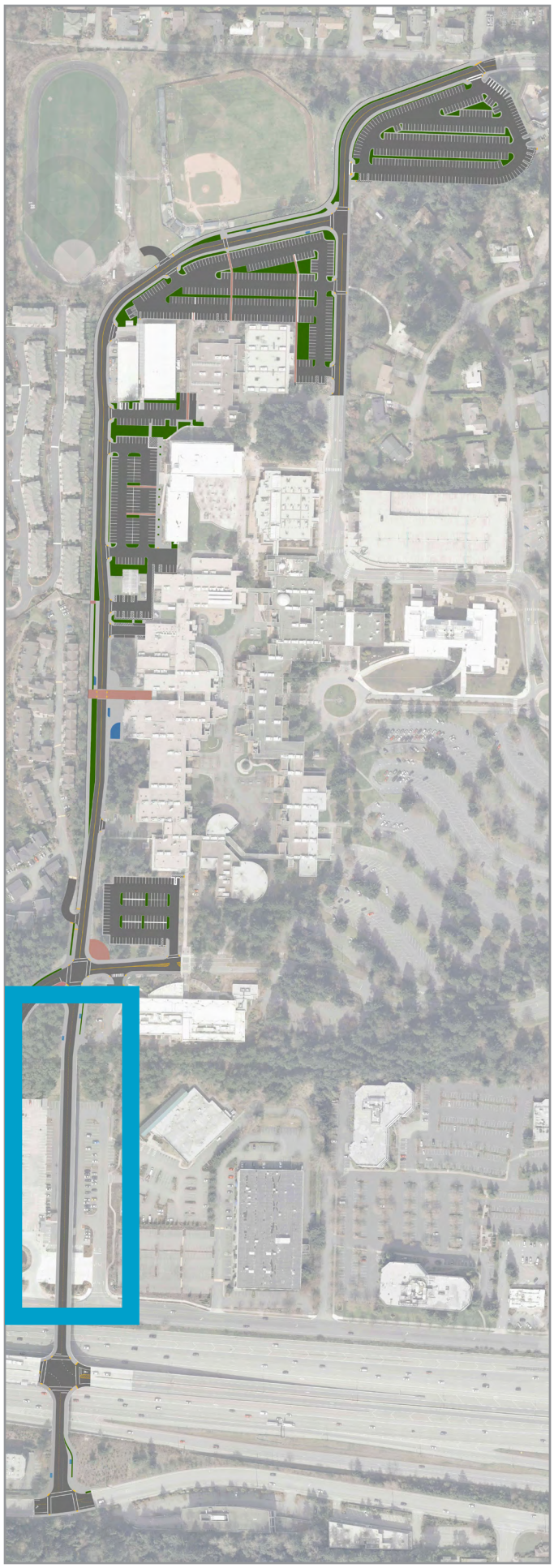
Pedestrian traffic changes sides at the intersection, from the west side of the road on 142nd Pl SE to the east side of the road on Snoqualmie River Rd. Sidewalks remain 8-feet wide except for at the bus zones, where the sidewalk width increases to 10 feet. A new 8-foot-wide sidewalk is designed on the north side of Coal Creek Rd between the intersection and the pedestrian crossing on Coal Creek Rd, approximately 250 feet east of the intersection.

Pedestrian access to the condominium development consists of an 8-foot-wide sidewalk to the west of and separated from the new bicycle facility by a 4-foot-wide planter strip.

Bicycle traffic also changes sides at the intersection. South of the intersection, it runs along the west side of 142nd Pl SE, has a direct access to the northbound bus zone, and then shifts east of the zone, separated by a 2.5-foot-wide planter strip. A 4-foot-wide planter strip is recommended and may be found to be feasible in later design stages. Bicycle traffic using this intersection will come mainly from the new bicycle facility proposed for the east side of 142nd Pl SE, which connects to the Mountains to Sound Greenway Trail, and from the new bicycle facility proposed for the west side of Snoqualmie River Rd.

The northeast corner of this intersection would be designed as a campus gateway that includes the Bellevue College logo. Landscaping could include a water element and/or a cut-thru crossing, which would benefit pedestrians traveling between Snoqualmie River Rd and Coal Creek Rd. The parking lot northeast of the intersection helps to compensate for the 28 parking stalls lost along Snoqualmie River Rd, increasing the number of stalls in this segment from 77 to 105 (see Appendix Table 25 on page A297).

Draft

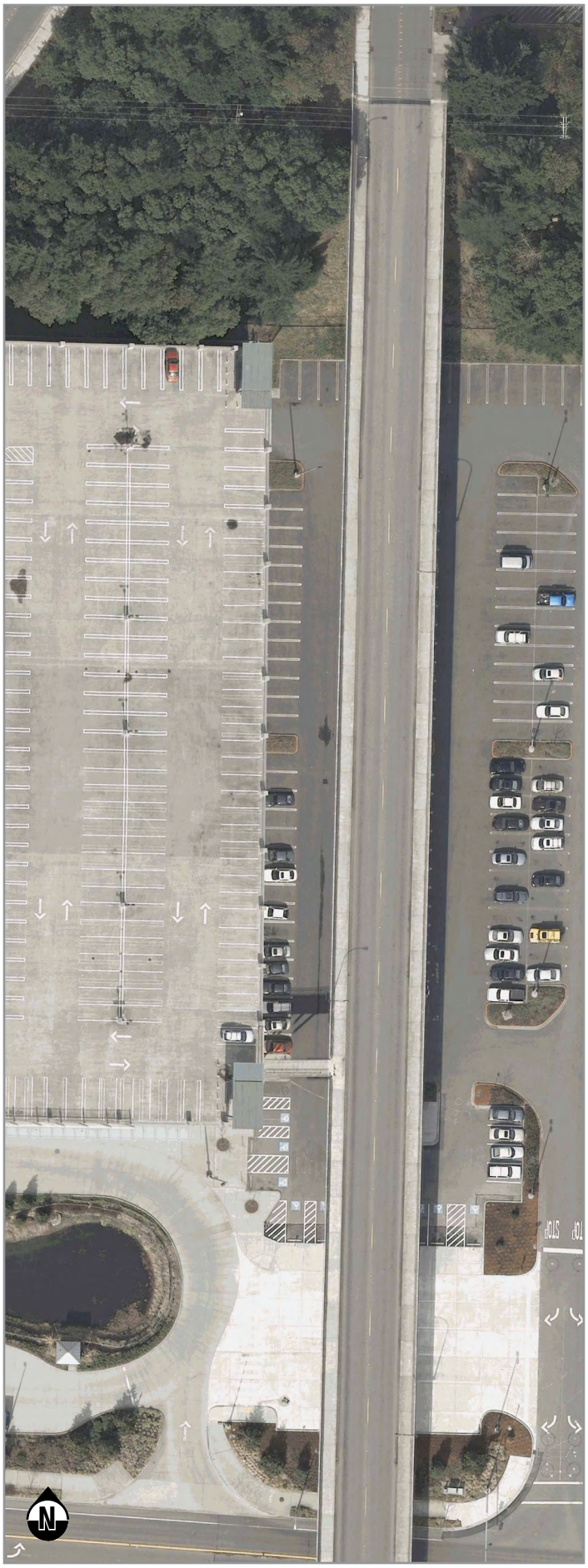


Segment 6

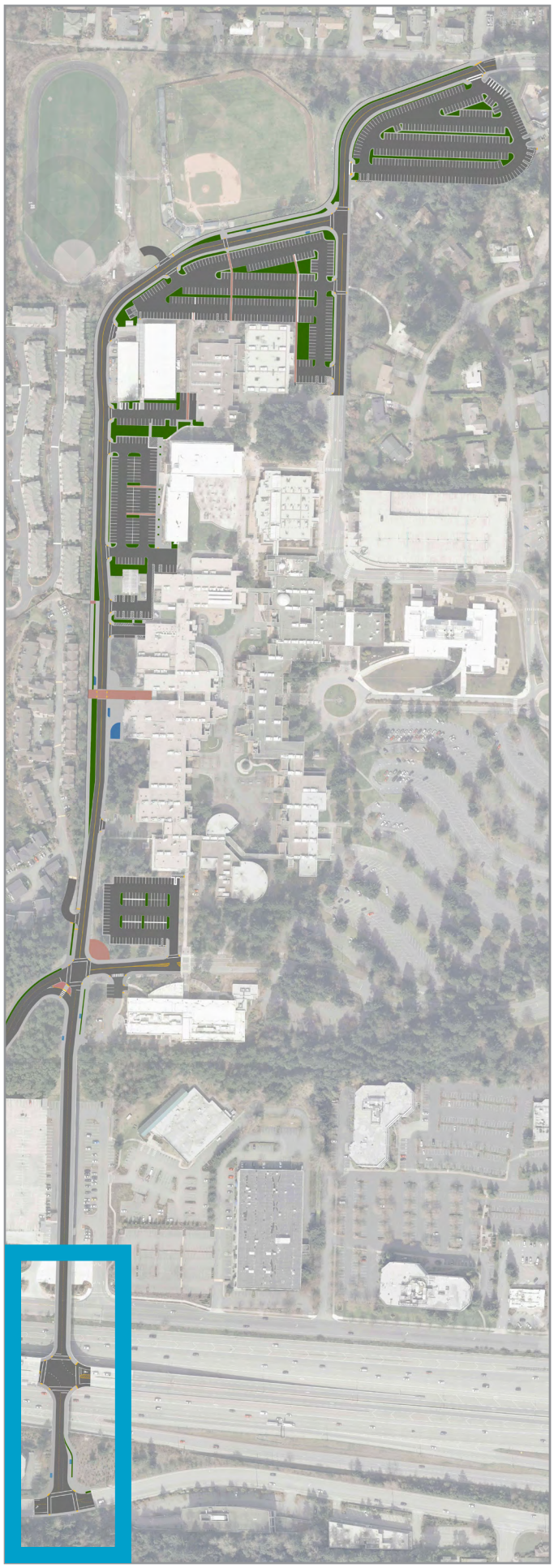
South of 142nd Pl SE/SE 32nd St to North of 142nd Pl SE/I-90 Direct Access Ramp

Consistent with recommendations in the *Eastgate/I-90 Transportation Strategies Report*, this preliminary design concept proposes modifications to the 142nd Pl SE Bridge that would improve the walking and bicycling experience there. There is significant pedestrian traffic on the west side of 142nd Pl SE Bridge, mainly to/from the Eastgate Park-and-Ride and Eastgate Freeway Station. Due to pedestrian volumes, an 8-foot-wide sidewalk is recommended on the west side of the road. The east side of the road is identified as a suitable location for an independent bicycle facility, providing a direct connection to the Mountains to Sound Greenway at the northeast corner of SE 36th St and 142nd Pl SE. A 10-foot-wide, two-way, elevated bicycle facility is thus recommended on the east side of the road. These non-motorized facilities leave 22 feet for general purpose travel lanes, which at 11-feet per lane satisfies the minimum width criteria to support transit operations.

Existing:



Proposed:



Segment 7

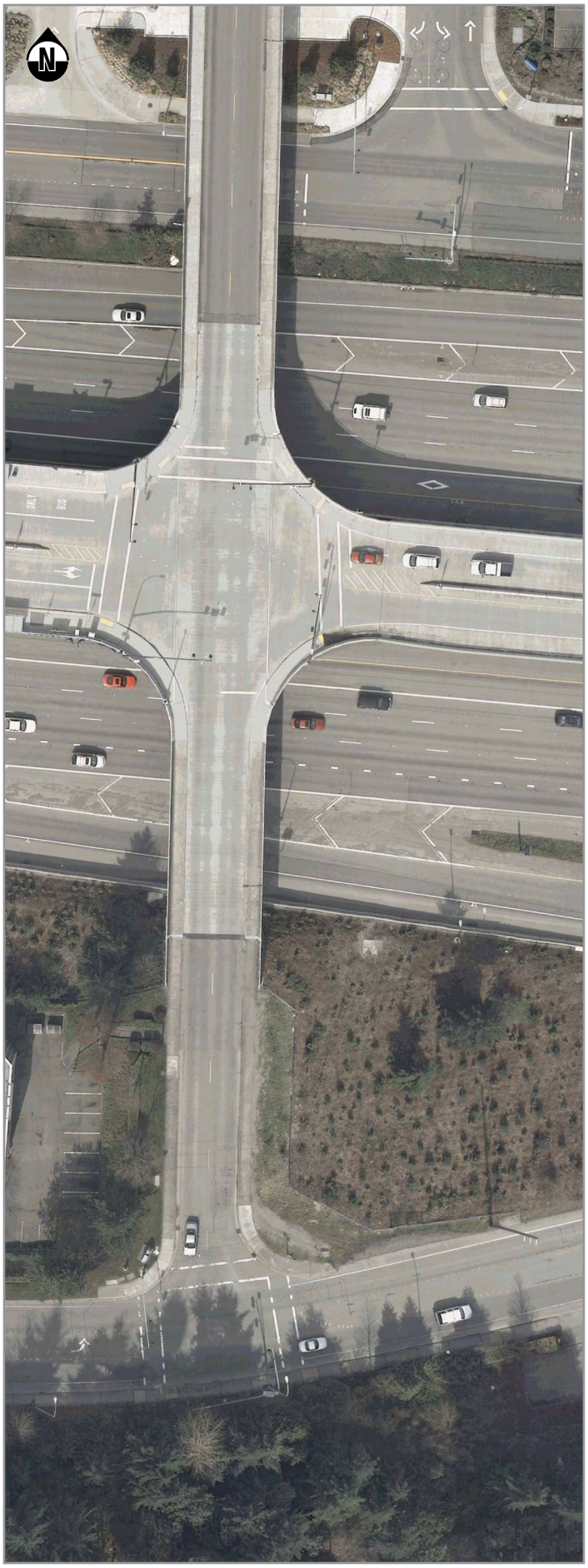
142nd Pl SE/I-90 Direct Access Ramp to 142nd Pl SE/SE 36th St

Users of the 142nd Pl SE/SE 36th St intersection include pedestrians, bicyclists, transit, and general purpose traffic. Bus movements through the intersection include Route 7FR, which travels southbound-to-westbound and eastbound-to-northbound, and Coverage Route 32, which travels southbound-to-eastbound and westbound-to-northbound. South of the 142nd Pl bridge structure, the travel lane width increases from 11 to 12 feet to facilitate bus operations.

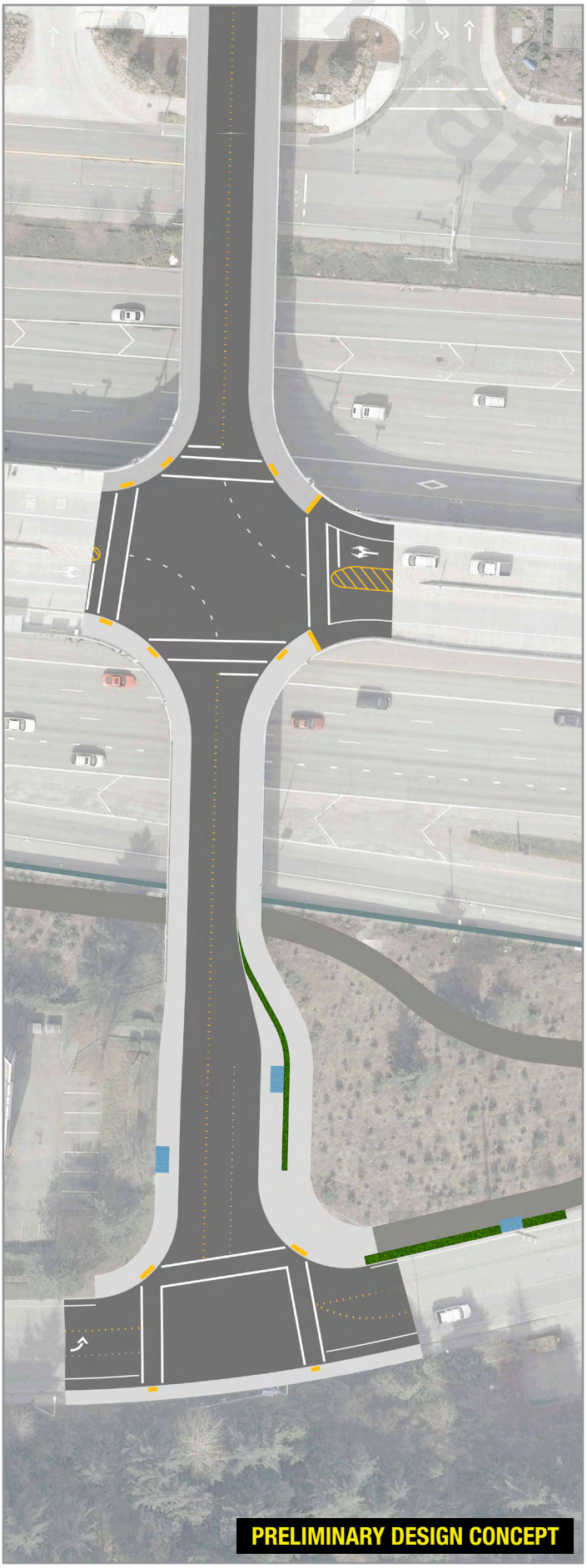
A pair of bus zones is recommended on both sides of 142nd Pl SE just north of SE 36th St—one for northbound and one for southbound buses. These stops serve as a transfer point for transit users connecting from Route 7FR or 32 to routes serving the Eastgate Freeway Station, located 300 feet north of the intersection. The southbound bus zone is in the only southbound lane of travel, so a bus pullout is not practical at this location, as buses turning eastbound onto SE 36th St would not be allowed to make the turn. A pullout lane is designed for the northbound bus zone, allowing other traffic to pass while a bus is stopped at the zone. Additionally, the improved 40-foot turn radius will allow a bus to start from its own lane of travel and finish within the receiving lane without encroaching on opposing traffic.

Because bus zones are located on both sides of 142nd Pl SE just north of SE 36th St, 10-foot-wide sidewalks are provided to comply with criteria for bus zone platform width. Transit users going to the northbound bus zone would cross to the west side of 142nd Pl SE at SE 36th St, not at the I-90 Direct Access Ramp intersection. Pedestrians and bicyclists using the intersection come from the Mountains to Sound Greenway Trail, SE 36th St, 142nd Pl SE, and from the bus zones.

Existing:



Proposed:



Draft

A 10-foot-wide two-way bicycle facility begins at the Mountains to Sound Greenway Trail on the east side of 142nd Pl SE, east of the northbound bus zone, separated from the zone by a 2.5-foot-wide planter strip. A 4-foot-wide horizontal separation between the bicycle facility and the bus zone is recommended; however, a wider planter strip would require a wider and thus more expensive bridge structure, especially given the existing slope of the site. Later design stages may consider a wider planter strip or a vertical separation instead. Bicyclists would cross to the west side of 142nd Pl SE at SE 36th St or at the I-90 Direct Access Ramp.

Next Steps

The preliminary design concept for the Bellevue College Connection: 142nd Pl SE/Snoqualmie River Rd Multimodal Transportation Corridor presented here represents the result of several months of coordination between the staffs at the City of Bellevue, Bellevue College, and King County Metro. This design was developed to account for the facility dimension requirements for each of the various modes and to comply with ADA requirements, but it should not be construed as a final engineering-level design, nor have the various stakeholders officially endorsed this proposal at the time of this report's publication.

Discussion with Bellevue College is ongoing and will continue, and final design decisions will be made in close coordination with the College in the coming months and years. The *Transit Service Vision Report* assumes the completion of this project prior to 2022, as the mid-term transit networks are designed to utilize this facility. However, the implementation timeline for this project will be determined as the process advances into later design stages.

Draft

Appendix Table 25 Impacts of the Multimodal Transportation Corridor preliminary design concept on parking stalls by segment.

	Segment 1 Kelsey Creek Rd/ SE 24th St to Kelsey Creek Rd/Snoqualmie River Rd	Segment 2 Snoqualmie River Rd/ Kelsey Creek Rd to Delivery Zone	Segment 3 Delivery Zone to Greenhouse	Segment 4 Bellevue College Transit Center on Snoqualmie River Road	Segment 5 142nd Pl SE/SE 32nd St	Total
Proposed	301	296	156	16	105	**874**
Current	227	203	173	108	77	**788**
Difference	+74	+93	-17	-92	+28	**+86**

Note: Segments 6 and 7 correspond to the 142nd Pl SE Bridge, which currently does not and will not include any parking.

Draft

APPENDIX D8: PROJECTS NO LONGER UNDER CONSIDERATION

Over the course of the Capital Element planning process, several potential projects were eliminated from further consideration due to one or more limitations that render the projects 'fatally flawed'. Appendix Table 26 documents the potential transit running way, queue jump, intersection, roadway, and signalization projects that are no longer being considered for advancement by the Transit Master Plan. The transit signal priority projects that have been eliminated from further consideration are listed in Appendix Table 27 on page A300.

Determining what constitutes a 'fatal flaw' is highly contextual, and there is no single characteristic that uniformly resulted in designation of a potential project as 'fatally flawed'. Generally, the potential projects identified as such are those for which limited right-of-way precludes required roadway expansion, ongoing or planned projects cannot accommodate the proposed changes or any similarly beneficial substitute, or the proposed projects lie entirely outside of Bellevue's jurisdiction. In the case of TSP projects, those eliminated from further consideration were primarily those for which Traffic Engineering staff identified significant conflicts with traffic patterns, signal phasing limitations, or other related issues.

The elimination of these projects from further consideration should not be construed to suggest that the projects are without merit, nor that the needs these projects address are inconsequential. In fact, the composite scores for projects Q4, Q20, and L21 are all in the highest tier, indicating significant LOS and queuing issues. Nevertheless, transit priority projects cannot be accommodated at these locations. It is therefore all the more important that other transit priority projects are implemented so that transit

Appendix Figure 27 Running Way Improvement Project L10: A shoulder transit-only bypass lane would eliminate signal and queuing delay for northwest-bound buses on this segment of Lake Hills Connector. It is no longer being considered because adjacent wetland easements limit the available right-of-way. Also pictured is Spot Improvement Project Q11, a queue jump lane that would assist southeast-bound buses. The latter project is still being considered and would require a new lane to be constructed if implemented as shown, but all existing general purpose travel lanes would be maintained.

Appendix Table 26 Potential transit running way, queue jump, intersection, roadway, and signalization projects eliminated from further consideration.

ID	Project	Type	FTN Service		Project Description	Composite Scores		Project Need	Reason for Project Elimination
			Routes	Frequency (Peak/Base/Night)		Short-Term	Long-Term		
Deleted HOV, BAT or General Purpose Lanes									
L10	Lake Hills Connector Tee Intersection Bypass	Lane Construction	13	8 / 10 / 15	Construct westbound transit bypass lanes at T-intersections with Richards Rd.	12–14	14–16	Addresses 2030 intersection LOS of E and queuing issues.	Wetland easements surround the intersection of Lake Hills Connector and Richards Rd, limiting the available space for construction of additional lanes. A sidewalk currently exists on the north side of the roadway, and a 10-14 foot-wide off-street path (O-123-N) is planned for this location as part of the Lake to Lake Trail priority bicycle corridor (EW-3). Construction of the proposed bypass lane would require removal of the existing pedestrian facility and preclude construction of the planned facility.
L15	Northup Way BAT Lane	Lane Restrictions	5, 14	4 / 5 / ~8	Implement BAT on Northup Way from 108th Ave NE to N 33rd Pl and add protected turn phase to improve LOS for turn.	16	24	Addresses current and future LOS issues (E and F, respectively) and queuing issues. Very frequent service on corridor.	Construction of the WSDOT SR-520 Eastside Transit and HOV Project had already commenced before TMP Capital Element planning began. That WSDOT project includes reconstruction of the intersection of Northup Way and 108th Ave NE, and the channelization being implemented was established based on the needs projected by WSDOT models of travel demand. Barring a substantial shift in mode split in favor of transit compared to the conditions projected by WSDOT, it is therefore considered highly unlikely that sufficient capacity will exist to convert a general purpose travel lane into a BAT lane without significant negative impacts to intersection LOS and queue lengths.
L16	Bellevue Way HOV Lane	Lane Construction	1	8 / 10-15 / 30	Construct northbound HOV lane for SR-520 westbound on-ramp to allow HOV traffic to bypass ramp meter and traffic queue.	7–9	12–15	Allows buses/HOV to bypass ramp queues.	Construction of the WSDOT SR-520 Eastside Transit and HOV Project had already commenced before TMP Capital Element planning began. Modifications to highway on-ramps and overpasses were therefore deemed to be highly unlikely if not impossible during the TMP planning horizon.
L21	148th Ave NE BAT Lane	Lane Construction	12	8 / 10 / 15	Construct northbound BAT lane on 148th Ave NE from approximately NE 40th St to NE 51st St.	21–23	21	Addresses current queuing issues as well as future LOS of F and very long queue.	Project extents lie entirely outside of Bellevue, in the jurisdiction of the City of Redmond.
Deleted Queue Jumps									
Q1	Bellevue Way to SR-520 Westbound HOV	Queue Jump	1	8 / 10-15 / 30	Construct HOV queue jump lane for transit and HOV to bypass general purpose traffic at onramp meter.	7-9	12-15	Allows buses/HOV to bypass ramp queues.	Construction of the WSDOT SR-520 Eastside Transit and HOV Project had already commenced before TMP Capital Element planning began. Modifications to highway on-ramps and overpasses were therefore deemed to be highly unlikely if not impossible during the TMP planning horizon.
Q4	108th Ave NE and Northup Way Northbound	Queue Jump	4, 5, 14	~3 / 3-4 / 5-6	Add queue jump to northbound right turn lane.	30	23	Addresses operator comments, existing and future LOS and queuing issue, and very high bus volumes	Construction of the WSDOT SR-520 Eastside Transit and HOV Project had already commenced before TMP Capital Element planning began. That WSDOT project includes reconstruction of the intersection of Northup Way and 108th Ave NE, which includes the addition of one general purpose travel lane to southbound 108th Ave NE and the inclusion of a bicycle lane in the northbound direction. Given the design of the intersection being implemented, it would not be possible to incorporate a queue jump lane in the northbound right turn lane.
Q11	Lake Hills Connector and Richards Rd - Eastbound	Queue Jump	13	8 / 10 / 15	Add queue jump to eastbound approach partially in of right turn lane and partially in new queue jump lane.	14	16	Addresses future intersection LOS of E and significant queuing.	Wetland easements surround the intersection of Lake Hills Connector and Richards Rd, limiting the available space for construction of additional lanes.
Q20	148th Ave NE and NE 51st St - Northbound	Queue Jump	7, 12	4 / 5 / ~8	Add queue jump to northbound approach in new right turn only lane.	21	21	Addresses existing queuing and future LOS of F and significant queuing	Project extents lie entirely outside of Bellevue, in the jurisdiction of the City of Redmond.

Note: These projects are conceptual and the final details of design would be developed if the projects were reconsidered and advanced further along in the implementation process.

Appendix Table 27 Potential transit signal priority (TSP) projects eliminated from further consideration.

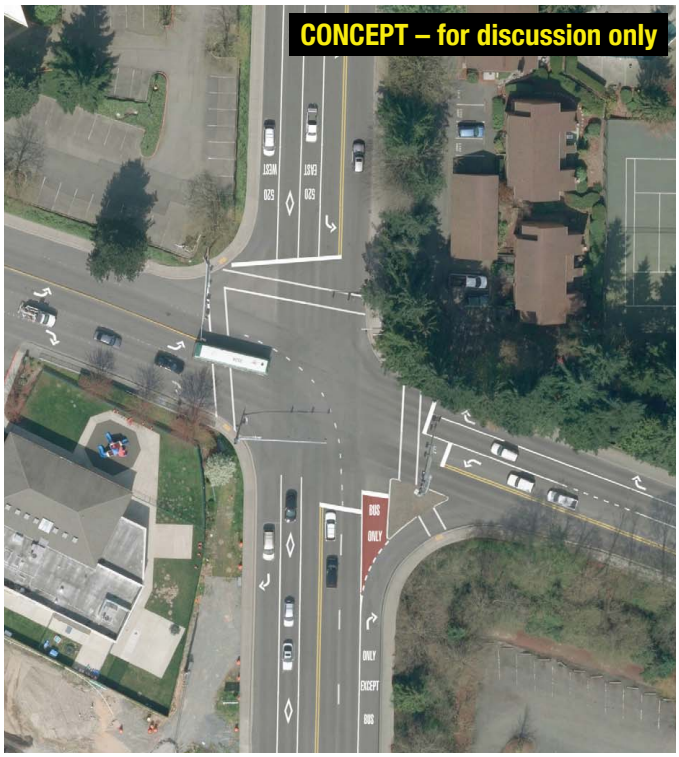
Intersection ID	Cross Streets	Direction(s)	Approach Composite Scores		FTN Route(s)	Reason for Project Elimination
			Short-Term	Long-Term		
8	Bellevue Way NE and NE 4th St	Northbound, Westbound	15–21	15–17	3, 6	Eliminated during the initial 'fatal flaw' screening per the direction of Traffic Engineering staff due to significant conflicts with traffic patterns, signal phasing limitations, and other related issues.
9	Main St and Bellevue Way	Northbound, Southbound, Westbound	16–24	15–18	3, 11	Eliminated during the initial 'fatal flaw' screening per the direction of Traffic Engineering staff due to significant conflicts with traffic patterns, signal phasing limitations, and other related issues.
47	148th Ave NE and NE 20th St	Northbound, Southbound	11	15	12	Eliminated during the initial 'fatal flaw' screening per the direction of Traffic Engineering staff due to significant conflicts with traffic patterns, signal phasing limitations, and other related issues.
51	Lake Hills Blvd and 148th Ave SE	Northbound, Southbound, Westbound, Eastbound	3–15	9–13	7, 12	Eliminated during the initial 'fatal flaw' screening per the direction of Traffic Engineering staff due to significant conflicts with traffic patterns, signal phasing limitations, and other related issues.
61	156th Ave NE and NE 24th St	Northbound, Southbound	12–16	17–18	7	Eliminated during the initial 'fatal flaw' screening per the direction of Traffic Engineering staff due to significant conflicts with traffic patterns, signal phasing limitations, and other related issues.
81	148th Ave NE and NE 24th St	Northbound, Westbound	13	18	12	Eliminated during the initial 'fatal flaw' screening per the direction of Traffic Engineering staff due to significant conflicts with traffic patterns, signal phasing limitations, and other related issues.
86	SE Eastgate Way and 156th Ave SE	Westbound, Eastbound	15–21	15–17	3, 6	Intersection no longer included on the most recent revision of the TSP project list submitted by consultant. No explanation was provided for its elimination.
90	SE Eastgate Way and 158th Ave SE	Westbound, Eastbound	15–21	15–17	3, 6	Intersection no longer included on the most recent revision of the TSP project list submitted by consultant. No explanation was provided for its elimination.
101	SE Eastgate Way and 150th Ave SE	Northbound, Westbound, Eastbound	14–26	12–14	13	Eliminated during the initial 'fatal flaw' screening per the direction of Traffic Engineering staff due to significant conflicts with traffic patterns, signal phasing limitations, and other related issues.
204	Factoria Blvd and SE 36th St	Northbound, Westbound, Eastbound	20–23	11–20	7, 11	Eliminated during the initial 'fatal flaw' screening per the direction of Traffic Engineering staff due to significant conflicts with traffic patterns, signal phasing limitations, and other related issues.
222	Factoria Blvd and SE 38th St	Northbound, Southbound	20–22	22–24	7, 11	Eliminated during the initial 'fatal flaw' screening per the direction of Traffic Engineering staff due to significant conflicts with traffic patterns, signal phasing limitations, and other related issues.
223	Coal Creek Pkwy SE and 119th Ave SE	Northbound, Westbound	13–17	19–20	11	Eliminated during the initial 'fatal flaw' screening per the direction of Traffic Engineering staff due to significant conflicts with traffic patterns, signal phasing limitations, and other related issues.
NA_10	NE 8th St and 148th Ave NE	Northbound, Southbound, Westbound, Eastbound	19–24	14–19	6, 12	Eliminated during the initial 'fatal flaw' screening per the direction of Traffic Engineering staff due to significant conflicts with traffic patterns, signal phasing limitations, and other related issues.
NA_11	148th Ave NE and Bel-Red Rd	Northbound, Southbound	11–20	15–19	12	Eliminated during the initial 'fatal flaw' screening per the direction of Traffic Engineering staff due to significant conflicts with traffic patterns, signal phasing limitations, and other related issues.

Note: These projects are conceptual and the final details of design would be developed if the projects were reconsidered and advanced further along in the implementation process.

services can travel quickly and efficiently, with minimal delay due to congestion, along other portions of the Frequent Transit Network to compensate for these locations where reduced speed and reliability is likely.

Running Way Improvement Project L10 and Spot Improvement Project Q4 provide representative examples of the kinds of projects no longer being considered because of 'fatal flaws' identified during the Capital Element planning process. Project L10 is a transit-only bypass lane that would be constructed in the shoulder on the north side of Lake Hills Connector. This lane would bypass long queuing delay and lengthy queues for northwest-bound buses on this segment, which in the 2030 PM peak are projected to average over 2 minutes and stretch nearly 1,000 feet. The intersection being bypassed is also projected to have an LOS of E in 2030. However, the project is no longer being considered because adjacent wetland easements limit the right-of-way available for construction of an additional lane, and a 10-14 foot-wide off-street path (O-123-N) planned for this location as part of the Lake to Lake Trail priority bicycle corridor (EW-3) precludes the bypass lane.

Project Q4 would have restructured the south approach of 108th Ave NE at Northup Way to incorporate the queue jump into a modified right turn lane. This would address 2030 average queuing delays of 4 minutes, average queue lengths of nearly 500 feet, and an LOS of F—all issues that are compounded by very high bus volumes of 675 daily trips. The project is no longer being considered because it cannot be accommodated by the WSDOT plans that are currently being implemented as part of the SR-520 Bridge Replacement and HOV Program. However, because the intersection configuration currently being constructed by WSDOT includes a northbound curbside bicycle lane, it would not be possible to modify the right turn lane as proposed without putting buses and bicycles in direct conflict with one another.



Appendix Figure 28 Spot Improvement Project Q4: Queue jump lane on 108th Ave NE for northbound buses at Northup Way. This project is no longer being considered because it cannot be accommodated by WSDOT plans currently being implemented. Also pictured is Running Way Improvement Project L17 along 108th Ave NE, a southbound HOV lane between South Kirkland Park-and-Ride and SR-520. Aerial images depict roadway striping before and after lane reconfiguration. Running Way Improvement Project L15, a BAT lane on Northup Way, is not pictured.

Draft

APPENDIX D9: POTENTIAL LONG-TERM TSP LOCATIONS

As noted in the section about transit signal priority projects (see page 169), potential TSP projects have been organized into three groups: near-term projects, deleted projects, and long-term projects. Appendix Table 28 lists all intersection approaches served by the 2030 Frequent Transit Network (FTN) that are not among the near-term or deleted projects. This should not be construed as a list of all long-term projects; rather, these are all of the signals that have not yet been eliminated from further consideration. King County Metro is expected to provide guidance by 2018 about its anticipated capacity to expand its TSP capabilities. The City will then consider that information when reviewing this list of intersection approaches to determine which should have long-term TSP projects pursued between 2020–2030.

If transit efficiency and reliability were the only two considerations necessary in determining where TSP should be deployed—that is, if cost were no object, impacts to other travel modes were deemed insignificant, and no technical limitations existed on where TSP could be deployed—then TSP might reasonably be pursued at all or most of these signals. However, this is of course not the case, as all of these other factors are also critical considerations in determining where transit priority can and should be implemented. Therefore, the specific projects that may be included in this group will not be identified until after 2020 when more information is available.

Appendix Table 28 Intersection approaches potentially eligible for long-term transit signal priority (TSP) projects.

Intersection ID	Cross Streets	Direction (Approach)	Long-Term Approach Composite Scores	FTN Route(s)	Previous TSP Priority	Related TMP Project	Related TFP Project
10	Bellevue Way SE & SE Wolverine Way	Northbound, Southbound	18	3, 11			
11	Bellevue Way SE & SE 8th St	Northbound, Southbound	18	3, 11			
12	Bellevue Way SE & SE 10th St	Northbound, Southbound	16–18	3, 11			
13	Bellevue Way SE & 108th Ave SE	Eastbound, Westbound, Northbound, Southbound	16–22	3, 11	X	X	
14	Bellevue Way SE & 112th Ave SE	Eastbound, Westbound, Northbound, Southbound	19–23	1, 3, 11	X	X	X
17	NE 4th St & 106th Ave NE	Eastbound, Westbound	17–19	3, 5, 6			
19	Main St & 106th Ave	Eastbound, Westbound	17–18	11			
22	NE 4th St & 108th Ave NE	Eastbound, Northbound, Southbound	18–19	1, 3, 5, 6, 11, 13		X	X
23	108th Ave NE & NE 2nd St	Northbound, Southbound	18–19	1, 2, 3, 5, 6, 11, 13		X	X
24	Main St & 108th Ave	Eastbound, Westbound, Southbound	18–24	1, 11, 13		X	X
29	116th Ave NE & NE 12th St	Northbound, Southbound, Westbound	16–24	5, 14			
31	Bellevue Way NE & NE 2nd St	Eastbound, Westbound, Northbound, Southbound	6–18	3. 5, 6	X	X	X
36	Main St & 112th Ave	Eastbound, Westbound, Northbound	18–24	1, 13		X	
37	Bel-Red Rd & 130th Ave NE	Eastbound, Westbound	10–15	14			
38	Bel-Red Rd & 132th Ave NE	Eastbound, Westbound	8–10	14			
40	Bel-Red Rd & 140th Ave NE	Northbound, Westbound	11–16	14		X	
50	Main St & 148th Ave	Northbound, Southbound	9–14	12			
52	148th Ave SE & SE 16th St	Northbound, Southbound	20	12			
53	148th Ave SE & SE 22nd St	Northbound, Southbound	8	12		X	
55	148th Ave SE & SE 24th St	Eastbound, Southbound	15	12		X	
60	156th Ave NE & Bel-Red Rd	Northbound, Southbound	16–18	7		X	
65	148th Ave SE & SE 8th St	Northbound, Southbound	6–10	12			
78	Northup Way & 108th Ave NE	Eastbound, Northbound, Southbound	23–24	4, 5, 14		X	
83	Main St & 156th Ave	Northbound, Southbound	8–12	7			
84	Lake Hills Blvd & 156th Ave SE	Eastbound, Southbound	9–13	7			
89	112th Ave SE & SE 8th St	Northbound, Southbound	12	1			
105	SE Eastgate Way & Richards Rd	Northbound	19	11			
108	Bellevue Way SE & Bellevue P&R Entrance	Eastbound, Westbound, Northbound, Southbound	14–22	1, 3, 11	X	X	X
114	Northup Way & NE 116th Ave	Eastbound, Northbound	24	5, 14		X	
135	Bellevue Way SE & SE 16th St	Northbound, Southbound	16	3, 11			
157	Main St & 110th Ave	Eastbound, Westbound	19–24	13		X	
165	NE 10th St & 116th Ave NE	Eastbound, Southbound	11–13	5		X	
171	SE 36th St & 142nd Pl SE	Eastbound, Westbound, Southbound	13–19	7		X	
175	Bel-Red Rd & 134th Ave NE	Eastbound, Westbound	8–11	14			
180	116th Ave SE & Overlake Hospital	Northbound, Southbound	11–17	5		X	
191	NE 6th St & I-405 Direct Access Ramp	Eastbound, Westbound, Northbound, Southbound	15–23	2, 6		X	X
202	Factoria Blvd & SE Newport Way	Northbound, Southbound	15–18	7, 11			
203	Coal Creek Pkwy & Factoria Blvd	Eastbound, Southbound	17–18	7, 11			
214	108th Ave NE & SR-520 Direct Access Ramp	Eastbound, Westbound, Southbound	23	4, 5, 14		X	
234	NE 10th St & 112th Ave NE	Eastbound, Westbound	15–17	5		X	
259	NE 10th St & I-405 on-ramp	Eastbound, Westbound	13–15	5			
263	156th Ave NE & NE 28th St	Northbound, Southbound	16–18	7		X	

Note: These projects are conceptual and the final details of design will be developed as the projects proceed further along in the implementation process.

Appendix Table 28 continued.

Intersection ID	Cross Streets	Direction (Approach)	Long-Term Approach Composite Scores	FTN Route(s)	Previous TSP Priority	Related TMP Project	Related TFP Project
268	148th Ave NE & NE 22nd St	Northbound, Southbound	19	12		X	X
280	Kamber Rd & 139th Ave SE	Northbound, Southwestbound	7–10	14			
282	Factoria Blvd & SE 41st St	Eastbound, Northbound, Southbound	5–14	7, 11			
284	Coal Creek Pkwy & 124th Ave SE	Eastbound, Westbound, Southbound	9–20	7			
285	Factoria Blvd & 3600 Block	Northbound, Southbound	19–20	7, 11		X	
291	SE 36th St & 132nd Ave SE	Westbound, Eastbound	6–20	7			
298	112th Ave SE & SE 6th St	Northbound, Southbound	12–20	1			
301	Factoria Blvd & Newport High School Entrance	Northbound, Southbound	13–15	7, 11			
304	148th Ave SE & Lake Hills Greenbelt Trail Crosswalk	Northbound, Southbound	16	12			
305	SE 36th St & 136th Pl SE	Eastbound, Westbound	6–13	7			
318	Factoria Blvd & SE 40th Ln	Northbound, Southbound	14–22	7, 11			
332	NE 10th St & Bellevue Library Crosswalk	Eastbound, Westbound	15–17	5		X	
332	NE 10th St & 110th Ave NE	Eastbound, Westbound	17–23	5		X	
NA_5	Bel-Red Rd & 124th Ave NE	Northbound, Southbound	14–15	14		X	X
NA_6	148th Ave NE & NE 36th St	Southbound, Westbound	16–18	12			
NA_7	NE 15th st & 120th Ave NE	Eastbound, Westbound	16	14			
NA_8	NE 15th st & 124th Ave NE	Eastbound, Northbound	14–15	14			
NA_9	NE 6th St & 120th Ave NE	Eastbound, Southbound	14–15	6		X	X

Note: These projects are conceptual and the final details of design will be developed as the projects proceed further along in the implementation process.

APPENDIX D10: TRANSIT PROJECT PRIORITY–COST MATRICES

Draft

Appendix Table 29 Matrix of the long-term priority of running way and spot improvement projects by cost.

Long-Term Project Priority	Project Cost: High Cost	Project Cost: Medium Cost	Project Cost: Low Cost
High Priority	**Project L1:** Bellevue Way SE HOV Lane - South Bellevue P&R	**Project L5:** 108th Ave NE Bus Priority Corridor	**Project L19:** NE 6th St Extension
	Project L2: Bellevue Way SE HOV Lane - South Bellevue P&R Extension	**Project L14:** NE 116th Ave NE BAT Lanes	**Project Q4:** Northup Way and 116th Ave NE - Northbound
	Project L3: Bellevue Way SE HOV Lane - 112th Ave SE Extension	**Project R11:** Northup Way and NE 116th St Turn Improvement	**Project Q5:** 116th Ave NE and NE 12th St - Southbound
	Project L4: 112th Ave SE HOV Lane		**Project Q7:** Main St and 112th Ave NE - Westbound
	Project L25: 148th Avenue NE Master Plan Improvements		**Project Q18:** NE 8th St and 148th Ave NE - Southbound
	Project L27: Snoqualmie River Road/142nd Pl SE Upgrade		**Project S4:** Coal Creek Pkwy SE and 119th Ave SE Turn Improvement
	Project R10: SE 36th ST and 142nd Ave SE		**Project S8:** Bellevue Way and South Bellevue Park and Ride TSP
			Project S9: 112th Ave NE and NE Main St Turn Improvement
			Project L12: NE 6th St Bus Priority Corridor
			Project R17: SR-520 and 108th Ave NE Exit Transit Priority
Medium Priority	**Project L9:** I-90 Factoria Blvd Exit Expansion	**Project L11:** Main St HOV Lane	**Project L20:** 124th Ave NE - Bel-Red Road to NE 14th Street
	Project L17: 108th Ave HOV Lanes	**Project L26:** 148th Ave NE BAT Lane - Overlake	**Project Q3:** Bellevue Way and Main St - Northbound
	Project L22: 140th Ave NE BAT Lane	**Project Q9:** Lake Hills Connector and SE 8th St - Eastbound	**Project Q12:** NE 8th Street and 140th Ave NE - Eastbound
	Project L23: 156th Ave NE BAT Lane - Northbound	**Project Q10:** Lake Hills Connector and SE 8th St - Westbound	**Project Q13:** NE 8th Street and 140th Ave NE - Northbound
	Project L24: 156th Ave NE BAT Lane - Southbound	**Project R3:** Northrup Way and 156th Ave NE Turn Radii	**Project Q15:** NE 8th Street and 140th Ave NE - Southbound
	Project Q14: NE 8th Street and 140th Ave NE - Westbound	**Project R13:** NE 12th St and 116th Ave NE Turn Lane	**Project S1:** NE 4th St and 108th Ave Turn Improvement
	Project R18: NE 4th St and Bellevue Way Turn Improvement	**Project R16:** NE 8th St and 120th Ave NE Turn Lane	
	Project S10: NE 8th St and 156th Ave NE Turn Improvement		
Low Priority	**Project L6:** 148th Ave SE Improvements - Bellevue College	**Project L13:** NE 10th ST HOV Lane	**Project Q2:** Bellevue Way and NE 12th St - Northbound
	Project R9: NE 2nd St and Bellevue Way Turn Improvement	**Project R2:** 156th Ave NE and NE 24th St Turn Radii	**Project Q6:** NE 10th St and 112th Ave NE - Westbound
	Project R15: 116th Ave SE and Main St Turn Lane	**Project R4:** Landerholm Circle and 148th SE Radii Improvements	**Project Q16:** NE 8th St and 148th Ave NE - Eastbound
		Project R5: SE 32nd St and 139th Ave SE Radii Improvement	**Project Q17:** NE 8th St and 148th Ave NE - Northbound
		Project R12: NE 8th St and 156th Ave NE Turn Radii	**Project Q19:** NE 8th St and 156th Ave NE - Northbound
		Project S3: South Kirkland P&R Signalizations	**Project R14:** NE 10th St and 116th Ave NE Channelization
			Project S6: SE 37th St and 150th Ave SE Turn Restriction
			Project S7: Bellevue Way and NE 10th St Turn Improvement

Appendix Table 30 Matrix of the short-term supplemental priority of running way and spot improvement projects by cost.

Short-Term Project Priority	Project Cost: High Cost	Project Cost: Medium Cost	Project Cost: Low Cost
High Priority	**Project L1:** Bellevue Way SE HOV Lane - South Bellevue P&R	**Project L5:** 108th Ave NE Bus Priority Corridor	**Project L12:** NE 6th St Bus Priority Corridor
	Project L2: Bellevue Way SE HOV Lane - South Bellevue P&R Extension	**Project R2:** 156th Ave NE and NE 24th St Turn Radii	**Project L19:** NE 6th St Extension
	Project L9: I-90 Factoria Blvd Exit Expansion	**Project R3:** Northrup Way and 156th Ave NE Turn Radii	**Project Q3:** Bellevue Way and Main St - Northbound
	Project L17: 108th Ave HOV Lanes	**Project R4:** Landerholm Circle and 148th SE Radii Improvements	**Project Q17:** NE 8th St and 148th Ave NE - Northbound
	Project L23: 156th Ave NE BAT Lane - Northbound	**Project R12:** NE 8th St and 156th Ave NE Turn Radii	**Project Q18:** NE 8th St and 148th Ave NE - Southbound
	Project L27: Snoqualmie River Road/142nd Pl SE Upgrade		**Project Q19:** NE 8th St and 156th Ave NE - Northbound
	Project R9: NE 2nd St and Bellevue Way Turn Improvement		**Project R17:** SR-520 and 108th Ave NE Exit Transit Priority
	Project R18: NE 4th St and Bellevue Way Turn Improvement		**Project S1:** NE 4th St and 108th Ave Turn Improvement
	Project S10: NE 8th St and 156th Ave NE Turn Improvement		
Medium Priority	**Project L24:** 156th Ave NE BAT Lane - Southbound	**Project L14:** NE 116th Ave NE BAT Lanes	**Project L20:** 124th Ave NE - Bel-Red Road to NE 14th Street
	Project L25: 148th Avenue NE Master Plan Improvements	**Project Q9:** Lake Hills Connector and SE 8th St - Eastbound	**Project Q4:** Northup Way and 116th Ave NE - Northbound
	Project Q14: NE 8th Street and 140th Ave NE - Westbound	**Project R11:** Northup Way and NE 116th St Turn Improvement	**Project Q5:** 116th Ave NE and NE 12th St - Southbound
		Project R16: NE 8th St and 120th Ave NE Turn Lane	**Project Q16:** NE 8th St and 148th Ave NE - Eastbound
		Project S3: South Kirkland P&R Signalizations	**Project R14:** NE 10th St and 116th Ave NE Channelization
			Project S8: Bellevue Way and South Bellevue Park-and-Ride TSP
Low Priority	**Project L3:** Bellevue Way SE HOV Lane - 112th Ave SE Extension	**Project L11:** Main St HOV Lane	**Project Q2:** Bellevue Way and NE 12th St - Northbound
	Project L4: 112th Ave SE HOV Lane	**Project L13:** NE 10th ST HOV Lane	**Project Q6:** NE 10th St and 112th Ave NE - Westbound
	Project L6: 148th Ave SE Improvements - Bellevue College	**Project L26:** 148th Ave NE BAT Lane - Overlake	**Project Q7:** Main St and 112th Ave NE - Westbound
	Project L22: 140th Ave NE BAT Lane	**Project Q10:** Lake Hills Connector and SE 8th St - Westbound	**Project Q12:** NE 8th Street and 140th Ave NE - Eastbound
	Project R10: SE 36th St and 142nd Ave SE	**Project R5:** SE 32nd St and 139th Ave SE Radii Improvement	**Project Q13:** NE 8th Street and 140th Ave NE - Northbound
	Project R15: 116th Ave SE and Main St Turn Lane	**Project R13:** NE 12th St and 116th Ave NE Turn Lane	**Project Q15:** NE 8th Street and 140th Ave NE - Southbound
			Project S4: Coal Creek Pkwy SE and 119th Ave SE Turn Improvement
			Project S6: SE 37th St and 150th Ave SE Turn Restriction
			Project S7: Bellevue Way and NE 10th St Turn Improvement
			Project S9: 112th Ave NE and NE Main St Turn Improvement

Draft

APPENDIX D11: VALUE OF TRAVEL TIME SAVINGS

Draft

To better understand the value of the projected improvements to travel speed realized by implementing all of the proposed HOV and BAT lane projects, an analysis was conducted to determine the aggregate number of revenue and passenger hours saved and the monetized value of these travel time savings to both transit users and operators. This appendix explains how the figures presented in the Potential Outcomes section (see page 178) were calculated .

Data from two separate travel demand models was used to complete this analysis, both of which assessed PM peak conditions based on the 2030 Growing Resources scenario. The first was Dynameq model D30R1.0.3, which was used to obtain transit travel speeds with and without implementation of all proposed HOV and BAT lane projects, as described on page 175 (see Table 28 on page 176 for results). Travel speeds were aggregated by FTN service type (i.e. FX, FR, and FL), and these were multiplied by the total annualized PM peak revenue miles operated by the routes in each category to obtain the estimated number of PM peak revenue hours operated. The number of hours operated in the HOV/BAT Lane Scenario was subtracted from the Baseline hours to obtain the estimated number of PM peak revenue hours saved, as shown in Appendix Table 31 below.

Appendix Table 31 2030 projected difference in PM peak speed and travel time by FTN service type - Baseline vs. HOV/BAT Scenarios.

FTN Service Type	PM Peak Rev Miles	PM Peak Avg Speed (mph)		Est. PM Peak Rev Hours		Est. PM Peak Rev Hours Saved		PM Peak Pass Hr / Rev Hr	Annualized PM Peak Pass Hours Saved
		Baseline	HOV/BAT	Est. Baseline	Est. HOV/ BAT	Baseline - HOV/BAT	% Diff		
Data Source:	Planned	Dynameq Model		Calculated		Calculated		BKR Model	Calculated
FX	816,446	18.1	19.1	45,008	42,657	2,352	5.2%	63.2	148,592
FR	290,891	12.4	12.6	23,535	23,014	521	2.2%	33.4	17,414
FL	474,491	12.1	13.1	39,117	36,248	2,869	7.3%	34.8	99,779
								Annual Total:	**265,786**

Appendix Table 32 2030 projected value of PM peak travel time savings for passengers from proposed HOV/BAT projects by service type.

FTN Service Type	Annualized PM Peak Pass Hours Saved	Mean Hourly Wage (Seattle-Bellevue-Everett)	Travel Time Value (Relative to Wage)			Value of Time ($/person hr)			Value of Pass Hrs Saved		
			Low: LOS A-C (Seated) / Urban Peak	Medium: LOS A-C (Standing)	High: LOS D (Seating/ Standing Average)	Low	Medium	High	Low	Medium	High
Data Source:	Calculated	Bureau of Labor Statistics	Victoria Transport Policy Institute			Calculated			Calculated		
FX	148,592	$27.68	35%	50%	57%	$9.69	$13.84	$15.78	$1,439,564	$2,056,519	$2,344,432
FR	17,414								$168,711	$241,016	$274,759
FL	99,779								$966,655	$1,380,936	$1,574,267
								Annual Total:	**$2,574,930**	**$3,678,471**	**$4,193,457**

Notes: Value of travel time savings based on the May 2012 mean hourly wage for Seattle-Everett-Bellevue of $27.68, obtained from the US Department of Labor Bureau of Labor Statistics. Low, Medium, and High estimates are based on the percentage of that wage considered when valuing transit passenger time, reflecting 35%, 50%, and 57%, respectively. Higher rates of time valuation relative to the mean hourly wage correspond to reduced perceived convenience due to lower intersection LOS (e.g. High corresponds to LOS 'D') and/or standing rather than sitting.

Draft

The second model that provided data for this analysis was the BKR travel demand model (EMME version MP30R6.2), which was used to project ridership by route. These ridership figures were multiplied by three (to convert from the single-hour projection to the full length of the PM peak period), then multiplied by 255 to provide an annualized weekday total. These were divided by the number of revenue hours planned for each route to estimate the number of passengers per revenue hour, which were then averaged by FTN service type, as shown in the second to last column in Appendix Table 31. Estimated PM peak revenue hours saved were multiplied by the number of passenger hours per revenue hour to obtain the total number of passenger hours saved by FTN service type, which when summed equals 265,786 hours annually. This figure is an estimate of the passenger-weighted hours saved during the PM peak period—that is, an aggregation of the couple of minutes each passenger would save each day during their evening commute over the course of a year.

A literature review was conducted to determine how to most appropriately value passenger travel time when monetizing these figures, and different sources provided different recommendations. Ultimately, figures recommended by the Victoria Transport Policy Institute (VTPI) were selected for this analysis, both because they are provided in the form of rates, which allow results to be calibrated to reflect the local average wage, and because different rates are provided for different travel modes, each with adjustments to reflect qualitative factors like comfort, convenience, and reliability (see Appendix Table 33). In Appendix Table 32, the Low, Medium, and High rates are 35%, 50%, and 57%, respectively. The Low rate is consistent with both that for seated transit passengers in LOS A-C conditions, and also with that cited by the VTPI for transit passengers under urban peak conditions (see VTPI 2009 page 5.2-20).

Appendix Table 33 Recommended travel time values relative to prevailing wages by travel mode and level-of-service (LOS).

Travel Mode	LOS A-C	LOS D	LOS E	LOS F
Personal Vehicle Driver	50%	67%	84%	100%
Adult Car Passenger	35%	47%	58%	70%
Adult Transit Passenger – Seated	35%	47%	58%	70%
Adult Transit Passenger – Standing	50%	67%	83%	100%
Pedestrians and Bicyclists	50%	67%	84%	100%

Adapted from "Transportation Cost and Benefit Analysis: Techniques, Estimates and Implications, Second Edition" by VTPI (2009), page 5.2-10.

The Medium rate is consistent with that for standing transit passengers in LOS A-C conditions, and the High rate reflects the average of the rates for seated and standing passengers in LOS D conditions. Given that the citywide average LOS is projected to be LOS D in 2030 whether or not HOV/BAT lane projects are implemented (see Table 29 on page 178), the High rate may be the most appropriate to consider, but a range is nevertheless provided to reflect the uncertainty inherent in such an analysis.

The wage by which all travel time valuation calculations are multipied in this analysis is $27.68. This is consistent with the May 2012 mean hourly wage estimate for the Seattle-Bellevue-Everett Metropolitan Division, as published by the US Bureau of Labor Statistics. Multiplying this wage by each of the rates noted above provides a range for the value of time per person hour, by which the total PM peak passenger hours saved were then multiplied for each FTN service type. This assessment suggests that transit passengers in Bellevue in 2030 will save between $2.5–$4.2 million worth of travel time annually in the PM peak period alone if the proposed HOV/BAT lanes are implemented.

As noted in the Potential Outcomes section, assessing the value of travel time savings for transit operators is somewhat more complicated. This is both because the ability to remove a bus from a schedule while maintaining the same headways depends on multiple factors that could not be reflected by this analysis, and because the travel demand models

Draft

Appendix Table 34 2030 projected value of PM peak travel time savings for transit operators from proposed HOV/BAT projects by FTN service type.

FTN Service Type	PM Peak Rev Miles	PM Peak Avg Speed (mph)		Est. PM Peak Rev Hours		Operating Cost per Hour		Annualized PM Peak Pass Hours Saved	
		Baseline	HOV/BAT	Est. Baseline	Est. HOV/BAT	Low[1]	High[2]	Low[1]	High[2]
Data Source:	Planned	Dynameq Model		Calculated		King County Metro		Calculated	
FX	816,446	18.1	19.1	2,352	5.2%	$89.00	$135.68	$209,285	$319,054
FR	290,891	12.4	12.6	521	2.2%			$46,399	$70,736
FL	474,491	12.1	13.1	2,869	7.3%			$255,322	$389,238
							Annual Total:	**$511,007**	**$779,027**

1. Low estimate based on King County Metro's 2010 marginal hourly operating cost of $89.
2. High estimate based on King County Metro's 2012 'Transit Operating Cost per Vehicle Hour', as reported on the agency's website at: http://metro.kingcounty.gov/am/reports/annual-measures/financial.html#cost-per-hour

Draft

used here to assess transit travel speed use the service frequencies defined by the 2030 Growing Resources scenario as model inputs, but operating these frequencies will only be possible if transit travel speeds meet or exceed the targets established in the *Service Vision Report*. Even so, it remains instructive to estimate the operating cost savings attributable to implementing these HOV and BAT lane projects, even if these savings are effectively reinvested in prodiving service at the frequencies being proposed.

As shown in Appendix Table 34, two values are considered in this analysis for operating cost per hour. The Low estimate ($89) is based on King County Metro's 2010 marginal hourly operating cost, while the High estimate ($135.68) is based on King County Metro's 2012 transit operating cost per vehicle hour, as reported on the agency's website. Both values are considered here because each represents a different way of assessing the cost of operating service. The marginal hourly operating cost (Low estimate) is the rate that is typically used when estimating the cost of revising existing services (e.g. adding or removing trips to an existing route), whereas the operating cost per vehicle hour (High estimate) is a more holistic cost estimate that also considers the planning, implementation, marketing, and other costs associated with operating transit service (e.g. the costs of fuel, operator wages). Multiplying the total travel time savings realized by HOV/BAT lane implementation by these operating costs per hour suggests that transit service providers would save between about $510,000–$780,000 annually in the PM peak period alone.

APPENDIX D12: 2030 CITYWIDE LEVEL OF SERVICE (LOS)

Appendix Table 35 Dynameq model output for 2030 citywide level of service (LOS) for FTN-served intersections.

#	Node ID	Intersection	2030 Reduced Funding w/o HOV/BAT Projects				2030 Growing Resources w/o HOV/BAT Projects				2030 Growing Resources with HOV/BAT Projects			
			Hourly Volume	Avg Intersec-tion Delay (sec)	LOS	Total Delay Hours in Peak Hour	Hourly Volume	Avg Intersec-tion Delay (sec)	LOS	Total Delay Hours in Peak Hour	Hourly Volume	Avg Intersec-tion Delay (sec)	LOS	Total Delay Hours in Peak Hour
1	981	100th Ave/Main Street	1,637	25	C	11	1,883	24	C	13	1,726	24	C	12
2	5455	102nd Ave/Main Street	1,619	20	C	9	1,417	19	B	8	1,360	19	B	7
3	979	100th Ave NE/NE 8th Street	1,799	33	C	17	2,077	26	C	15	2,040	23	C	13
4	5097	102nd Ave NE/NE 8th Street	1,900	25	C	13	1,893	22	C	12	1,938	23	C	12
5	1750	Bellevue Way NE/NE 12th Street	3,159	32	C	28	3,526	34	C	33	3,134	33	C	28
6	5017	Bellevue Way NE/NE 10th Street	3,535	23	C	22	3,491	23	C	22	3,032	26	C	22
7	1738	Bellevue Way NE/NE 8th Street	4,463	55	D	68	4,236	52	D	61	4,335	51	D	61
8	2640	Bellevue Way NE/NE 4th Street	3,589	37	D	37	3,467	40	D	39	3,328	39	D	36
9	1736	Bellevue Way/Main Street	2,577	66	E	48	2,572	37	D	26	2,407	39	D	26
11	5105	Bellevue Way SE/SE 8th Street	3,827	44	D	47	3,609	30	C	30	3,338	24	C	22
12	5106	Bellevue Way SE/SE 10th Street	3,106	10	A	8	2,939	4	A	4	2,840	5	A	4
13	1717	108th Ave SE/Bellevue Way SE	3,634	62	E	62	2,954	65	E	53	2,905	18	B	15
14	1716	112th Ave SE/Bellevue Way SE	4,260	119	F	141	3,531	78	E	77	3,588	36	D	35
15	5020	106th Ave NE/NE 12th Street	2,621	26	C	19	2,622	28	C	21	2,472	32	C	22
16	5021	106th Ave NE/NE 8th Street	4,466	61	E	76	4,360	66	E	80	4,348	69	E	83
17	5022	106th Ave NE/NE 4th Street	3,713	46	D	47	3,582	49	D	49	3,534	61	E	60
18	5025	106th Ave NE/NE 2nd Street	3,097	27	C	23	3,059	25	C	21	2,684	63	E	47
19	1735	106th Ave/Main Street	2,184	24	C	14	2,196	38	D	23	2,028	85	F	48
20	1749	108th Ave NE/NE 12th Street	3,563	17	B	17	3,499	21	C	21	3,400	43	D	41
21	1739	108th Ave NE/NE 8th Street	4,988	69	E	95	4,786	64	E	85	4,208	76	E	88
22	2641	108th Ave NE/NE 4th Street	2,659	34	C	25	2,653	29	C	21	2,944	47	D	38
23	5027	108th Ave NE/NE 2nd Street	1,565	68	E	30	1,621	46	D	21	1,829	73	E	37
24	1734	108th Ave/Main Street	2,856	24	C	19	2,624	53	D	39	2,764	91	F	70
25	1748	112th Ave NE/NE 12th Street	5,129	51	D	73	4,709	50	D	65	4,570	59	E	75
26	1740	112th Ave NE/NE 8th Street	7,310	71	E	145	7,571	71	E	150	6,853	91	F	174
27	5031	110th Ave NE/NE 8th Street	5,684	65	E	102	5,636	75	E	118	4,832	96	F	129
28	5018	Bellevue Way NE/NE 6th Street	2,469	5	A	3	2,160	4	A	3	1,898	4	A	2
29	1747	116th Ave NE/NE 12th Street	5,507	68	E	104	5,506	56	E	85	5,283	58	E	84
30	1741	116th Ave NE/NE 8th Street	7,375	55	E	113	7,452	53	D	110	6,657	58	E	108
31	5019	Bellevue Way NE/NE 2nd Street	3,261	32	C	29	3,111	22	C	19	2,803	23	C	18
32	5509	120th Ave NE/NE 12th Street	3,876	39	D	42	4,124	36	D	41	4,254	35	D	41
34	1745	124th Ave NE/Bellevue-Redmond Rd	3,174	51	D	45	3,260	55	D	50	3,338	53	D	49
35	1743	124th Ave NE/NE 8th Street	4,907	43	D	59	4,790	51	D	67	4,650	40	D	52
36	1733	112th Ave/Main Street	5,177	67	E	96	5,049	90	F	127	5,182	66	E	95
37	5036	130th Ave NE/Bellevue-Redmond Rd	2,026	13	B	7	2,047	13	B	7	2,118	14	B	9
38	5037	132nd Ave NE/Bellevue-Redmond Rd	2,388	18	B	12	2,375	16	B	11	2,439	17	B	12
39	1754	140th Ave NE/NE 20th Street	4,471	34	C	42	4,346	34	C	41	4,338	36	D	43
40	1755	140th Ave NE/Bellevue-Redmond Rd	4,165	41	D	48	4,047	44	D	50	3,959	48	D	53
41	1731	140th Ave NE/NE 8th Street	4,140	93	F	107	4,031	80	F	90	4,004	55	E	62

Appendix Table 35 continued.

#	Node ID	Intersection	2030 Reduced Funding w/o HOV/BAT Projects				2030 Growing Resources w/o HOV/BAT Projects				2030 Growing Resources with HOV/BAT Projects			
			Hourly Volume	Avg Intersec-tion Delay (sec)	LOS	Total Delay Hours in Peak Hour	Hourly Volume	Avg Intersec-tion Delay (sec)	LOS	Total Delay Hours in Peak Hour	Hourly Volume	Avg Intersec-tion Delay (sec)	LOS	Total Delay Hours in Peak Hour
42	5073	140th Ave/Main Street	2,032	14	B	8	1,944	14	B	7	1,862	14	B	7
43	1721	140th Ave SE/SE 8th Street	2,549	46	D	33	2,385	39	D	26	2,326	37	D	24
44	5078	145th Place SE/Lake Hills Blvd	1,647	31	C	14	1,451	13	B	5	1,450	10	B	4
45	1715	145th Place SE/SE 16th Street	2,301	50	D	32	2,052	45	D	26	1,976	40	D	22
47	1763	148th Ave NE/NE 20th Street	5,042	103	F	144	4,959	104	F	143	5,723	83	F	132
48	1756	148th Ave NE/Bellevue-Redmond Rd	5,371	75	E	112	5,195	83	F	119	5,497	59	E	89
49	1730	148th Ave NE/NE 8th Street	5,485	42	D	64	4,987	45	D	62	4,874	45	D	60
50	5074	148th Ave/Main Street	3,737	29	C	30	3,350	28	C	26	3,333	27	C	25
51	1714	148th Ave SE/Lake Hills Blvd	3,081	30	C	26	2,885	32	C	25	2,902	31	C	25
52	1713	148th Ave SE/SE 16th Street	3,372	41	D	38	3,166	33	C	29	3,181	40	D	36
53	1700	148th Ave SE/SE 22nd Street	2,686	44	D	33	2,532	25	C	18	2,679	21	C	16
54	6122	145th Place SE/SE 24th Street	1,132	18	B	6	957	12	B	3	1,006	12	B	3
55	6123	148th Ave SE/SE 24th Street	2,770	36	D	28	2,460	22	C	15	2,464	17	B	12
57	6166	148th Ave SE/SE 28th Street	3,990	135	F	150	3,684	130	F	133	3,710	118	F	122
58	1757	Bellevue-Redmond Rd/NE 20th Street	4,491	44	D	55	4,588	46	D	58	4,764	41	D	54
59	1762	Bellevue-Redmond Rd/NE 24th Street	4,219	53	D	62	4,095	46	D	53	4,055	51	D	57
60	5099	156th Ave NE/Bellevue-Redmond Rd	4,171	93	F	108	4,171	85	F	98	4,635	50	D	64
61	1761	156th Ave NE/NE 24th Street	4,008	62	E	69	3,930	59	E	65	4,517	46	D	58
62	1758	156th Ave NE/Northup Way	4,383	85	F	103	4,460	62	E	77	4,576	65	E	83
63	1729	156th Ave NE/NE 8th Street	3,285	39	D	35	3,157	38	D	34	2,786	40	D	31
64	1765	140th Ave NE/NE 24th Street	3,385	78	E	74	3,368	98	F	92	3,151	73	E	64
65	1722	148th Ave SE/SE 8th Street	2,869	6	A	4	2,642	5	A	3	2,657	6	A	5
67	6131	156th Ave NE/NE 10th Street	2,083	22	C	13	1,901	23	C	12	1,751	21	C	10
68	1753	130th Ave NE/NE 20th Street	2,803	35	C	27	2,854	28	C	22	2,863	33	C	27
69	5003	Bellevue Way NE/NE 24th Street	2,440	30	C	20	2,738	29	C	22	2,562	32	C	23
70	5551	156th Ave NE/NE 13th Street	2,547	22	C	15	2,461	25	C	17	2,504	25	C	17
71	1719	Lk Hills Connector/SE 8th St/7th Pl	3,552	112	F	110	3,491	72	E	69	3,252	79	E	72
72	2642	112th Ave NE/NE 4th Street	4,500	135	F	169	4,540	105	F	132	4,845	102	F	138
73	1732	116th Ave/Main Street	3,628	34	C	34	3,409	32	C	31	3,463	38	D	37
74	1769	Bellevue Way NE/Northup Way NE	2,404	90	F	60	2,621	71	E	52	2,603	110	F	79
75	5057	164th Ave NE/NE 24th Street	2,732	35	D	27	2,528	49	D	34	2,443	33	C	23
76	1637	164th Ave NE/Northup Way	3,274	32	C	29	3,176	23	C	21	3,080	25	C	22
77	5066	130th Ave NE/NE 24th Street	2,201	38	D	23	2,175	39	D	24	2,293	56	E	35
78	1768	108th Ave NE/Northup Way NE	3,137	122	F	106	3,300	125	F	114	3,221	116	F	103
79	5058	148th Ave NE/NE 40th Street	3,093	71	E	61	2,663	152	F	112	2,908	59	E	48
81	1764	148th Ave NE/NE 24th Street	4,890	92	F	125	4,736	85	F	112	4,666	78	E	101
82	1698	Richards Rd/Kamber Rd	2,960	54	D	45	2,956	49	D	40	2,751	36	D	28
83	5075	156th Ave/Main Street	2,064	15	B	9	1,916	16	B	9	1,771	16	B	8
84	1724	156th Ave SE/Lake Hills Blvd	1,946	24	C	13	1,797	23	C	12	1,697	21	C	10
85	6054	Richards Rd/SE 32nd Street	2,626	69	E	50	2,600	52	D	37	2,569	37	D	27
86	1770	156th Ave SE/SE Eastgate Way	2,925	44	D	36	2,758	49	D	38	2,572	43	D	30
87	1728	164th Ave NE/NE 8th Street	2,832	45	D	36	2,780	32	C	25	2,689	34	C	26
88	1766	124th Ave NE/Northup Way NE	2,798	86	F	67	2,927	64	E	52	3,005	107	F	90
89	1718	112th Ave SE/SE 8th Street	1,532	26	C	11	1,237	18	B	6	1,148	23	C	7
90	6124	158th Ave SE/SE Eastgate Way	1,390	15	B	6	1,287	15	B	5	1,205	14	B	5

Appendix Table 35 continued.

#	Node ID	Intersection	2030 Reduced Funding w/o HOV/BAT Projects				2030 Growing Resources w/o HOV/BAT Projects				2030 Growing Resources with HOV/BAT Projects			
			Hourly Volume	Avg Intersec-tion Delay (sec)	LOS	Total Delay Hours in Peak Hour	Hourly Volume	Avg Intersec-tion Delay (sec)	LOS	Total Delay Hours in Peak Hour	Hourly Volume	Avg Intersec-tion Delay (sec)	LOS	Total Delay Hours in Peak Hour
91	1776	160th Ave SE/SE Eastgate Way	1,188	19	B	6	1,179	20	B	6	1,190	20	C	7
92	5101	161st Ave SE/SE Eastgate Way	1,770	37	D	18	1,697	40	D	19	1,624	34	C	15
93	6156	Lk Washington Blvd/NE 1st/NE 10th St	679	32	C	6	1,488	32	C	13	1,404	32	C	13
94	1737	92nd Ave NE/NE 8th Street	1,432	16	B	6	1,548	27	C	12	1,510	27	C	11
96	980	100th Ave NE/NE 4th Street	1,711	18	B	9	1,580	16	B	7	1,494	16	B	6
97	5080	156th Ave SE/SE 24th St/22nd Pl	1,796	60	E	30	1,599	67	E	30	1,570	56	E	25
98	5104	Coal Creek Parkway/Forest Drive	3,362	37	D	34	3,357	40	D	37	3,447	29	C	28
99	5895	Somerset Blvd/SE Newport Way	844	21	C	5	687	24	C	4	692	20	C	4
100	2540	92nd Ave NE/Lk Washington Blvd	893	11	B	3	1,537	37	D	16	1,513	53	D	22
101	5331	150th Ave SE/SE Eastgate Way	3,378	35	D	33	3,169	33	C	29	3,132	32	C	28
102	5087	118th Ave SE/SE 8th Street	2,742	95	F	72	2,747	60	E	45	2,641	75	E	55
104	6125	SE Allen Rd/SE Newport Way	1,203	22	C	7	969	17	B	5	907	19	B	5
105	5083	Richards Rd/SE Eastgate Way	3,453	83	F	80	3,569	48	D	48	3,717	85	F	88
106	2900	121st Ave SE/SE 8th Street	2,277	29	C	19	2,152	40	D	24	2,036	22	C	12
107	5033	112th Ave NE/NE 6th Street	3,251	87	F	79	3,525	66	E	64	3,627	62	E	63
108	5109	Bellevue Way SE/P&R/112th Ave SE	4,890	158	F	214	4,028	185	F	207	3,957	147	F	162
111	1726	Northup Way/NE 8th Street	1,536	40	D	17	1,609	49	D	22	1,656	56	E	26
114	1767	116th Ave NE/Northup Way NE	1,821	86	F	44	1,810	108	F	54	1,457	81	F	33
116	6210	115th Place NE/Northup Way	2,133	91	F	54	2,389	83	F	55	2,381	56	E	37
117	5510	120th Ave NE/NE 20th Street	1,373	28	C	11	1,811	31	C	16	2,058	54	D	31
118	5067	Northup Way/NE 24th Street	1,836	48	D	25	2,363	36	D	23	2,619	42	D	31
119	5004	108th Ave NE/NE 24th Street	1,082	18	B	5	1,110	19	B	6	1,068	22	C	6
123	5059	140th Ave NE/NE 40th Street	1,940	101	F	54	1,836	108	F	55	1,880	102	F	53
124	5030	110th Ave NE/NE 6th Street	1,779	41	D	20	1,851	41	D	21	1,717	61	E	29
126	5026	108th Ave NE/NE 6th Street	1,161	36	D	12	870	47	D	11	999	29	C	8
128	5032	112th Ave NE/NE 2nd Street	3,425	62	E	59	3,426	54	D	51	3,154	60	E	52
129	5096	102nd Ave NE/NE 10th Street	1,908	15	B	8	2,056	15	B	8	1,793	15	B	8
130	5012	100th Ave NE/NE 10th Street	1,106	11	B	3	1,248	14	B	5	1,205	13	B	4
131	5086	116th Ave SE/SE 1st Street	2,813	46	D	36	2,585	36	D	26	2,273	31	C	19
132	2901	Richards Rd/SE 30th Street	2,061	48	D	27	2,081	24	C	14	1,964	16	B	9
133	1692	150th Ave SE/SE Newport Way	2,690	37	D	27	2,818	47	D	37	2,795	39	D	30
134	1720	Richards Rd/Lk Hills Connector	1,818	69	E	35	1,765	57	E	28	1,794	47	D	24
135	5107	Bellevue Way SE/SE 16th Street	3,335	43	D	40	3,004	61	E	51	3,190	27	C	24
136	5604	Bellevue Way NE/NE 30th Street	2,184	21	C	13	2,538	38	D	27	2,317	52	D	34
138	5053	Bellevue-Redmond Rd/NE 40th Street	2,977	37	D	31	2,829	42	D	33	3,015	29	C	24
139	5506	116th Ave NE/NE 4th Street	3,989	81	F	90	3,637	71	E	72	3,716	52	D	53
141	5010	100th Ave NE/NE 1st Street	2,253	22	C	13	2,176	21	C	12	2,012	16	B	9
143	5894	Coal Creek Parkway/SE 60th Street	2,943	28	C	23	2,810	24	C	19	2,910	23	C	18
144	5463	102nd Ave NE/NE 1st Street	1,385	18	B	7	1,306	20	C	7	1,235	19	B	6
145	5426	102nd Ave NE/NE 4th Street	1,849	14	B	7	1,733	12	B	6	1,646	14	B	6
146	5326	SE Eastgate Way/SE 35th Place	1,406	19	B	7	1,373	21	C	8	1,290	18	B	6
152	5436	105th Ave NE/NE 4th Street	2,194	19	B	12	2,128	15	B	9	2,123	19	B	11
153	3387	114th Ave SE/SE 8th St (Bellfield Office	1,135	30	C	9	1,130	17	B	5	1,082	16	B	5
154	5023	106th Ave NE/NE 10th Street	3,137	33	C	29	3,193	36	D	32	2,663	58	E	43
157	5028	110th Ave/Main Street	2,325	24	C	16	2,289	70	E	44	2,835	34	C	27

Appendix Table 35 continued.

#	Node ID	Intersection	2030 Reduced Funding w/o HOV/BAT Projects				2030 Growing Resources w/o HOV/BAT Projects				2030 Growing Resources with HOV/BAT Projects			
			Hourly Volume	Avg Intersec-tion Delay (sec)	LOS	Total Delay Hours in Peak Hour	Hourly Volume	Avg Intersec-tion Delay (sec)	LOS	Total Delay Hours in Peak Hour	Hourly Volume	Avg Intersec-tion Delay (sec)	LOS	Total Delay Hours in Peak Hour
158	5029	110th Ave NE/NE 2nd Street	2,036	95	F	54	2,136	100	F	59	2,238	95	F	59
159	5641	110th Ave NE/NE 4th Street	3,428	116	F	110	3,437	63	E	60	3,780	108	F	114
162	5401	110th Ave NE/NE 12th Street	3,738	22	C	23	3,633	24	C	25	3,484	37	D	36
164	5708	OHCM Internal Rd/NE 10th St Extension	2,338	29	C	19	2,248	25	C	16	2,218	31	C	19
165	5505	116th Ave NE/NE 10th St Extension	3,716	22	C	23	3,746	18	B	19	3,465	37	D	35
171	5088	142nd PL SE/SE 36th Street	1,674	47	D	22	1,576	57	E	25	1,626	43	D	20
173	1712	156th Ave SE/SE 16th Street	2,233	6	A	3	2,095	5	A	3	2,069	5	A	3
174	5595	150th Ave SE/SE 38th Street	3,123	70	E	61	3,122	66	E	58	3,128	72	E	62
175	6252	134th Ave NE/Bellevue-Redmond Rd	2,916	17	B	14	2,938	20	B	16	2,971	19	B	16
179	5024	106th Ave NE/NE 6th Street	2,312	15	B	10	2,199	14	B	9	2,112	20	C	12
180	7077	116th Ave NE/OHMC Entrance	2,180	14	B	8	2,264	14	B	9	1,995	20	C	11
181	5046	SE 1st St/120th Ave/Main Street	1,610	29	C	13	1,468	19	B	8	1,394	21	C	8
185	6032	136th Place NE/Northup Way	2,651	22	C	16	2,532	21	C	15	2,637	21	C	15
186	3109	120th Ave NE/NE 6th Street	2,673	23	C	17	2,273	23	C	15	2,149	20	C	12
188	6006	148th Ave NE/NE 29th Place	3,494	103	F	100	3,400	107	F	101	3,383	72	E	68
189	5803	NE 29th Place/NE 24th Street	2,009	14	B	8	1,847	20	B	10	1,683	11	B	5
190	6200	108th Ave NE/NE 10th Street	2,839	39	D	31	2,964	45	D	37	2,677	58	E	43
195	2321	148th Ave NE/NE 36th Street	2,777	36	D	28	2,584	62	E	45	2,754	34	C	26
198	5050	W Lk Sammamish Parkway/NE 40th Street	1,119	12	B	4	1,013	11	B	3	959	10	B	3
202	1693	128th Ave SE/Newport/SE Newport Way	2,406	29	C	19	2,325	16	B	10	2,274	16	B	10
203	1694	Factoria BLVD/Coal Creek Pkwy	3,075	81	F	69	3,162	52	D	45	3,159	44	D	39
204	5084	128th Ave SE/SE 36th Street	4,075	41	D	46	4,102	33	C	38	4,275	35	C	41
219	5286	I-405 NB Ramps/SE 8th Street	2,450	48	D	33	2,249	54	D	34	2,354	48	D	32
220	6110	I-405 NB Ramps/Coal Creek Parkway	3,572	55	E	55	3,718	38	D	39	3,705	42	D	43
221	6114	I-405 SB Ramps/Coal Creek Parkway	2,220	169	F	104	2,249	168	F	105	2,088	171	F	99
222	6065	128th Ave SE/SE 38th Place	3,077	78	E	66	2,936	88	F	72	3,020	82	F	69
223	6109	119th Ave SE/Coal Creek Parkway	3,667	103	F	105	3,702	81	F	84	3,725	69	E	71
224	5652	I-405 SB Ramps/NE 4th Street	3,712	48	D	50	3,689	48	D	49	3,942	48	D	53
225	5653	I-405 NB Ramps/NE 4th Street	3,182	59	E	52	3,367	56	E	52	3,324	42	D	39
226	5277	I-405 SB Ramps/SE 8th Street	1,221	51	D	17	1,068	28	C	8	1,378	37	D	14
227	2902	150th Ave SE/I-90 EB Off-Ramp/SE 36th St	3,026	80	E	67	3,024	92	F	77	3,037	75	E	64
228	1690	Lakemont Blvd (SR-901)/SE Newport Way	3,023	59	E	50	3,132	46	D	40	3,152	46	D	40
233	5091	120th Ave NE/NE 8th Street	5,303	53	D	78	5,001	46	D	63	4,792	42	D	56
234	5393	112th Ave NE/NE 10th Street	4,379	56	E	68	4,271	55	E	66	4,170	54	D	62
235	6201	110th Ave NE/NE 10th Street	2,919	49	D	40	2,913	50	D	40	2,760	31	C	24
238	1682	Coal Creek Parkway/SE 72nd Place	3,000	24	C	20	2,831	23	C	18	2,958	26	C	21
239	5098	156th Ave NE/NE 40th Street	5,165	72	E	103	4,903	62	E	84	4,873	51	D	69
245	6104	119th Ave SE/SE 60th Street	1,695	8	A	4	1,360	3	A	1	1,375	3	A	1
248	6078	148th Ave SE/SE 46th Street	1,490	3	A	1	1,531	4	A	2	1,518	4	A	2
249	2214	148th Ave NE/NE 51st Street	3,765	107	F	112	3,599	125	F	125	3,626	123	F	124
250	5383	SR-520 SB Ramps/NE 51st Street	2,610	29	C	21	2,585	28	C	20	2,549	29	C	20
251	5387	SR-520 NB Ramps/NE 51st Street	2,501	57	E	39	2,422	45	D	30	2,351	48	D	31
252	5038	132nd Ave NE/NE 20th Street	2,339	31	C	20	2,400	31	C	21	2,429	28	C	19
255	5229	156th Ave NE/NE 51st Street	3,573	111	F	110	3,429	111	F	105	3,508	95	F	92
260	6220	I-90 EB On-Ramp/SE Newport Way	1,739	5	A	2	1,906	5	A	2	1,920	4	A	2

Appendix Table 35 continued.

#	Node ID	Intersection	2030 Reduced Funding w/o HOV/BAT Projects				2030 Growing Resources w/o HOV/BAT Projects				2030 Growing Resources with HOV/BAT Projects			
			Hourly Volume	Avg Intersec-tion Delay (sec)	LOS	Total Delay Hours in Peak Hour	Hourly Volume	Avg Intersec-tion Delay (sec)	LOS	Total Delay Hours in Peak Hour	Hourly Volume	Avg Intersec-tion Delay (sec)	LOS	Total Delay Hours in Peak Hour
262	7766	W Lk Sammamish Parkway/SR-520 EB Off-Ramp	3,356	65	E	60	3,286	70	E	64	3,375	67	E	63
263	6016	156th Ave NE/NE 28th Street	2,580	57	E	41	2,672	37	D	28	2,996	41	D	34
264	6132	156th Ave NE/NE 31st Street	2,838	38	D	30	3,094	34	C	29	3,037	48	D	40
265	5061	148th Ave NE/Old Redmond Road	4,326	42	D	51	4,189	46	D	54	4,204	52	D	61
266	6170	151st Ave NE/NE 24th Street	2,047	39	D	22	1,922	45	D	24	2,021	20	C	11
267	6018	152st Ave NE/NE 24th Street	3,446	61	E	58	3,154	74	E	65	3,498	52	D	51
268	5539	148th Ave NE/NE 22nd Street (Sears)	2,967	23	C	19	2,956	26	C	21	3,349	25	C	24
269	5516	132th Ave NE/NE 16th Street	1,725	21	C	10	1,453	19	B	8	1,700	21	C	10
270	6039	140th Ave NE/NE 18th St (Evergreen Mall)	2,017	3	A	2	1,829	3	A	2	1,565	4	A	2
272	5573	139th Ave SE/SE Eastgate Way	1,497	14	B	6	1,542	14	B	6	1,573	14	B	6
275	2215	W Lk Sammamish Parkway/NE 51st Street	3,356	46	D	43	3,251	58	E	52	3,319	65	E	60
276	1760	Bellevue-Redmond Rd/W Lk Sammamish Parkway	2,634	69	E	51	2,609	70	E	51	2,743	53	D	41
277	7078	156th Ave NE/NE 36th Street	3,558	34	C	34	3,554	31	C	31	3,650	31	C	32
279	5247	148th Ave NE/SR-520 EB Off-Ramp	4,095	15	B	18	4,044	15	B	17	3,917	16	B	18
280	5578	139th Ave SE/Kamber Road	2,005	41	D	23	2,100	30	C	17	1,993	21	C	12
282	1141	128th Ave SE/SE 41st Street	2,120	15	B	9	1,934	18	B	10	1,922	21	C	11
284	6068	124th Ave SE/Coal Creek Parkway	3,108	57	E	49	3,190	53	D	47	3,184	50	D	44
285	6064	128th Ave SE/3600 Block	3,421	44	D	42	3,417	44	D	42	3,530	40	D	39
294	5508	124th Ave NE/NE 16th Street	2,016	29	C	16	1,727	31	C	15	1,849	34	C	17
295	1121	120th Ave NE/NE 4th Street	2,815	12	B	9	2,109	11	B	7	2,161	11	B	7
300	7671	W Lk Sammamish Parkway/Marymoor Park	2,993	64	E	53	2,889	83	F	67	2,963	78	E	64
		Subtotal	565,672			8,141	552,955			7,665	548,186			7,350
		Citywide Average Vehicle Delay (sec)	51.8				49.9				48.3			
		Citywide Total Delay Hours	8,141				7,665				7,350			
		Citywide Average LOS	D				D				D			

Note: The 'Citywide' totals above reflect all intersections citywide through which FTN services operate.

Bellevue Transit Master Plan

July 2014

Department of Transportation

Draft

May 1, 2014

prepared for the
May 8, 2014 meeting of the
Transportation Commission

Draft

Title VI Notice to Public

It is the City of Bellevue's policy to assure that no person shall, on the grounds of race, color, national origin or sex, as provided by Title VI of the Civil Rights Act of 1964, be excluded from participation in, be denied the benefits of, or be otherwise discriminated against under any of its federally funded programs and activities. Any person who believes his/her Title VI protection has been violated may file a complaint with the Title VI Coordinator. For Title VI complaint forms and advice, please contact the Title VI Coordinator at 425-452-4496.

Draft

RESOLUTION NO.

[Placeholder text, placeholder text.

Placeholder text, placeholder text.]

Draft

Draft

CONTENTS

Resolution No. ### iii

EXECUTIVE SUMMARY 1

BACKGROUND 9

Introduction 10
- Plan Purpose 10
- Planning Process 12
- Community Outreach 17
  - Transit Improvement Survey 18
  - TMP Forum and Workshops 25

Existing and Future Conditions 28
- Background 28
- Existing Transit Landscape (2003–2013) 30
  - Existing Services 30
  - Service Performance 34
- Future Transit Landscape (2014–2030) 35
  - Population & Employment Growth 35
  - Travel Demand Growth 36
  - Future Roadway Investment 37
  - East Link Light Rail 38

POLICY ELEMENT 41

- TMP Policy Framework 42
  - Vision Statement 44
  - Goal Statements 44
  - Transit Strategies 45

SERVICE ELEMENT 53

Service Vision 54
- Context 54
  - Time Horizons 55
  - Funding Scenarios 55
  - Cost Baseline 56
  - Construction Mitigation 56
  - Service Types 57
- Proposed Networks 58
  - 2030 Service Vision 60
  - 2022 Service Vision 66
  - 2015 Service Vision 70

CAPITAL ELEMENT 77

Capital Vision 78
- Context 78
- The Development Lot 80
- The Pedestrian and Bicycle Environment 84
- The Transit Stop 88
  - Bus Stop Amenities 88
  - Commuter Parking 90
  - Bus Layover Needs 91
- Transit Running Way 92
  - Project Prioritization 94

APPENDICES 99

- Appendix 1: Glossary 100
- Appendix 2: TMP Project Principles 103
- Appendix 3: Transit Master Plan Document Library 104
  - Service Element Documents 104
- Appendix 4: Service Vision Resource Allocation 108
- Appendix 5: Measures of Effectiveness (MOEs) 110
  - Existing Metrics 110
- Proposed Measures 113
  - Service Availability 114

ACKNOWLEDGEMENTS 126

Draft

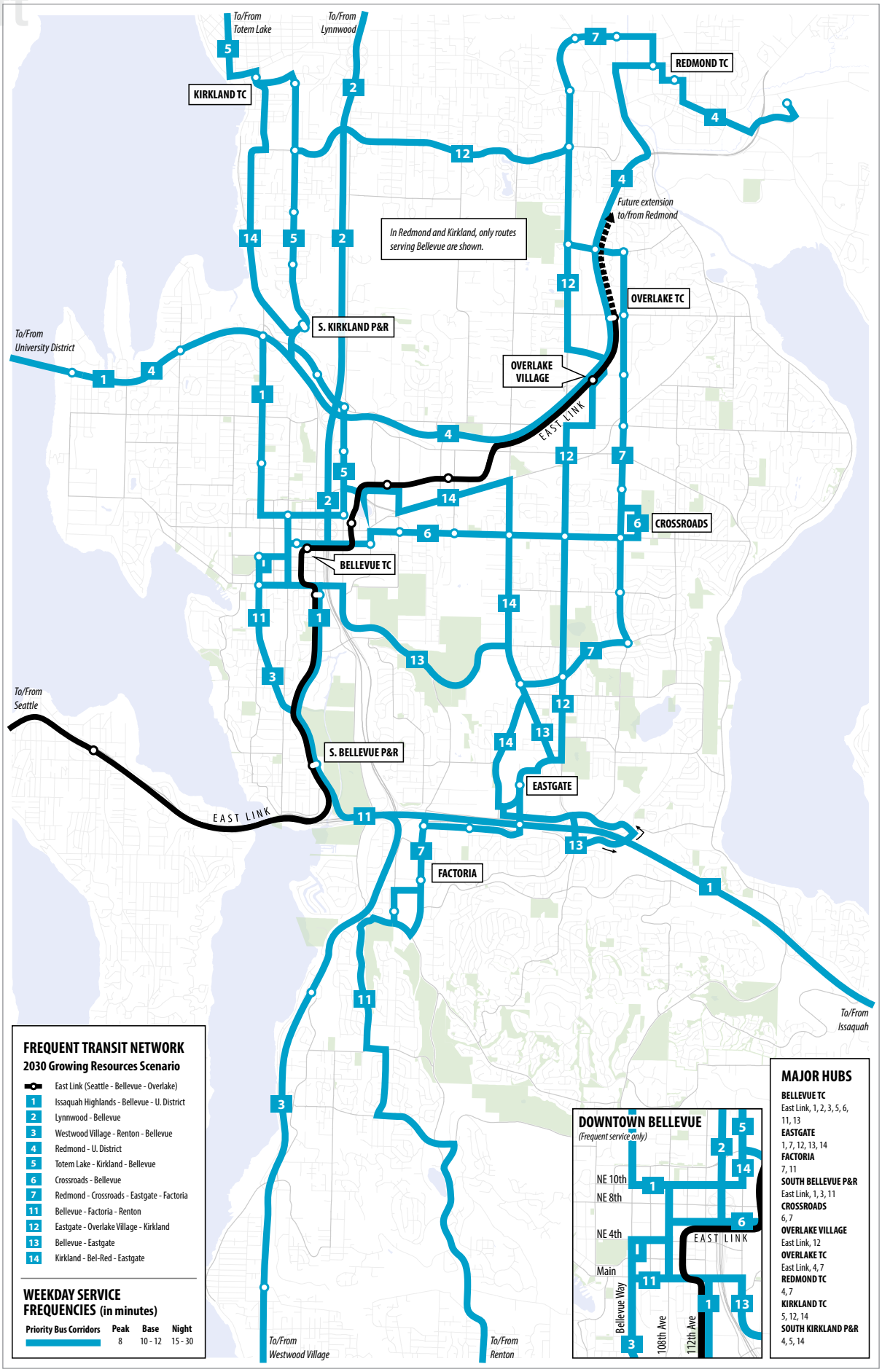


Figure 1 2030 Frequent Transit Network (FTN).

EXECUTIVE SUMMARY

INTRODUCTION

The Bellevue Transit Master Plan (TMP) is a comprehensive, twenty year look ahead at the system that will be required to meet Bellevue's transit needs through 2030. The TMP establishes short- and long-term strategies and projects that help foster a high-quality transit system that is more effective at connecting residents, employees, and visitors in Bellevue with the places they want to go.

This report summarizes the two-year long TMP planning process, including a review of existing and future conditions and community outreach conducted in support of the plan, and presents the City's service and capital visions for transit in Bellevue. The Policy Element functions as the guiding framework for the planning process and identifies the strategies that should be pursued to realize the service and capital visions. The Service Element presents route-level recommendations that are responsive to different financial scenarios (reduced, stable, and growing resources) and attune to different time horizons (2015, 2022, and 2030). The 2030 Frequent Transit Network (FTN) shown at left (Figure 1) represents the core of the most abundant scenario presented (the 2030 Growing Resources Network). Finally, the Capital Element identifies more than 100 projects that can be implemented along transit running ways and at intersections to improve the speed and reliability of transit services operating along FTN corridors.

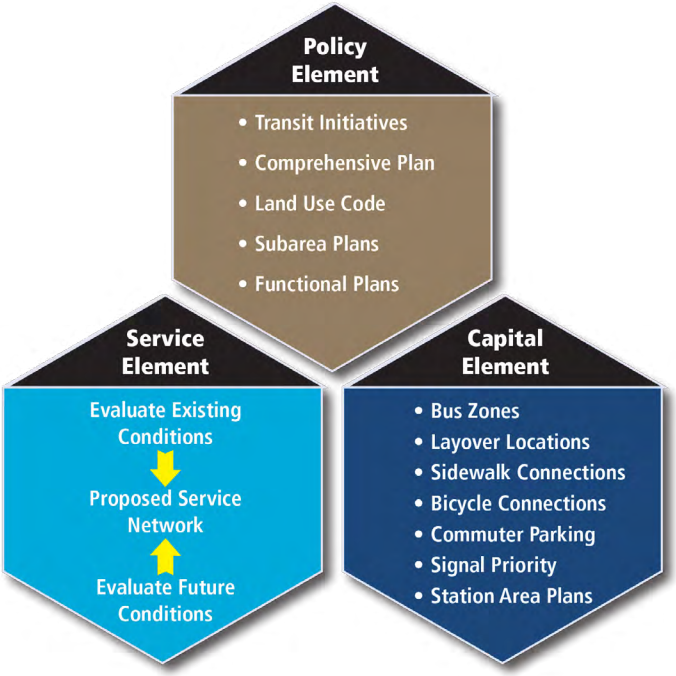
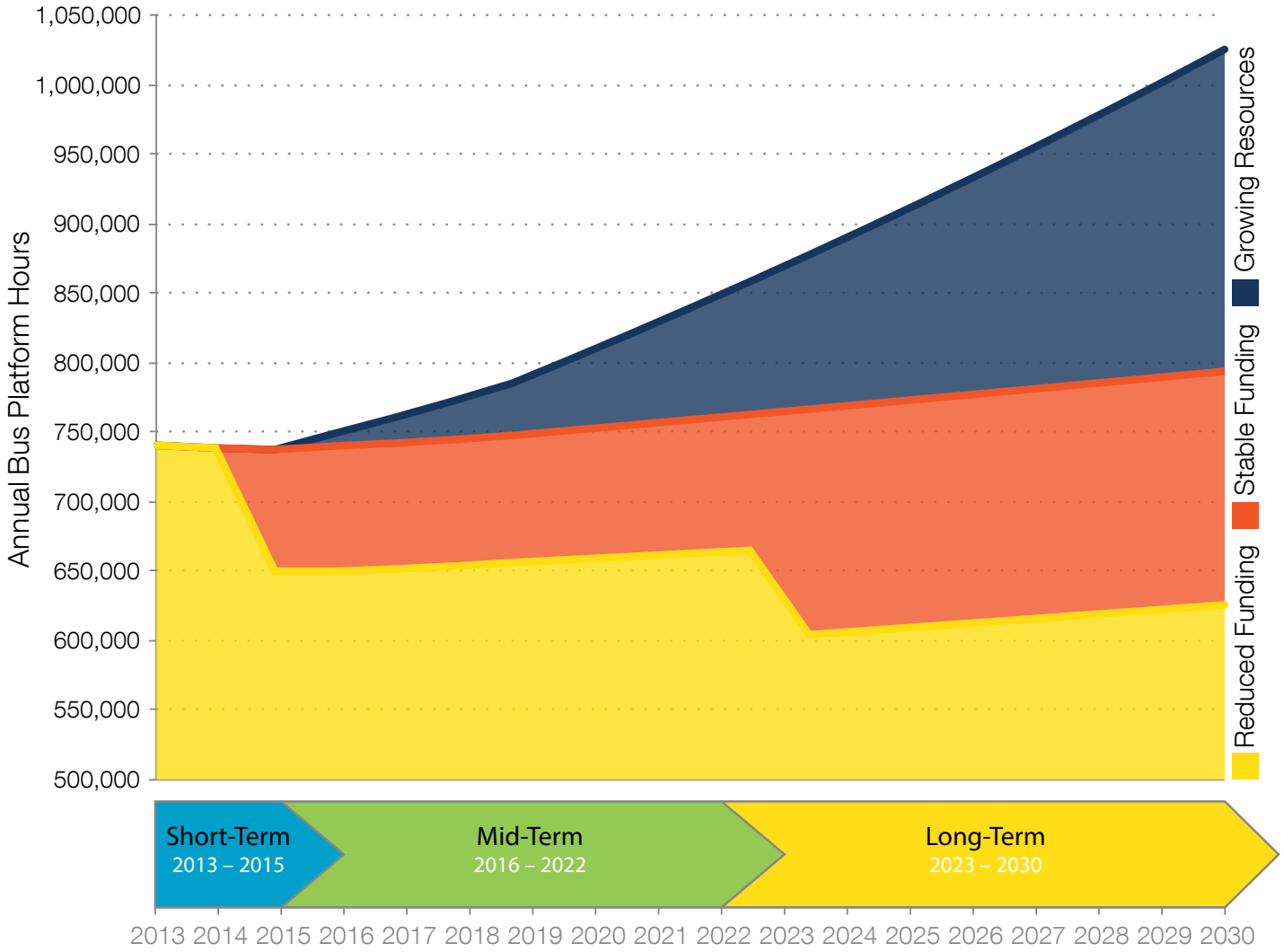


Figure 2 The Transit Master Plan (TMP) is comprised of three major elements—the Policy, Service, and Capital Elements.

Draft

Figure 3 Projected future bus service funding scenarios.



WHAT IS THE TRANSIT MASTER PLAN?

While the City of Bellevue doesn't operate its own transit system, it can positively influence regional transit agencies to keep Bellevue moving and maximize transit performance with supportive land uses that maximize existing transit facility investments. The Bellevue Transit Master Plan (or TMP) is timely in the current environment where King County Metro's financial outlook is compromised, and service cuts and fare increases are an immediate reality commencing in September 2014. In the near-term, the TMP ensures that the City's transit interests are effectively represented before regional committees, transit authorities, and other agencies. As Bellevue grows and matures, TMP strategies will become increasingly important to supporting the transportation system and level-of-service standards in Bellevue's Comprehensive Plan. The TMP aims to maximize the return on investment on existing and anticipated public transportation projects by coordinating with local and regional transit efforts to identify the types of service and capital features required to meet Bellevue's needs today and through 2030.

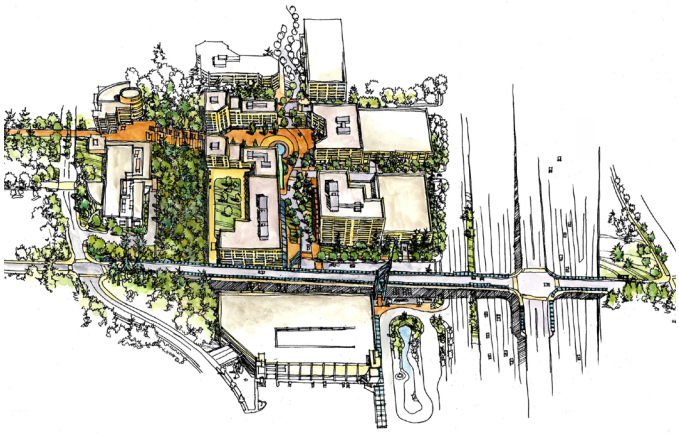
Draft

Figure 4 Planned and projected growth in Bellevue activity centers is closely related to investments in transit.

2030 Vision for Growth in Downtown Bellevue

East Link Light Rail in Downtown Bellevue

Transit-Oriented Development in Bel-Red



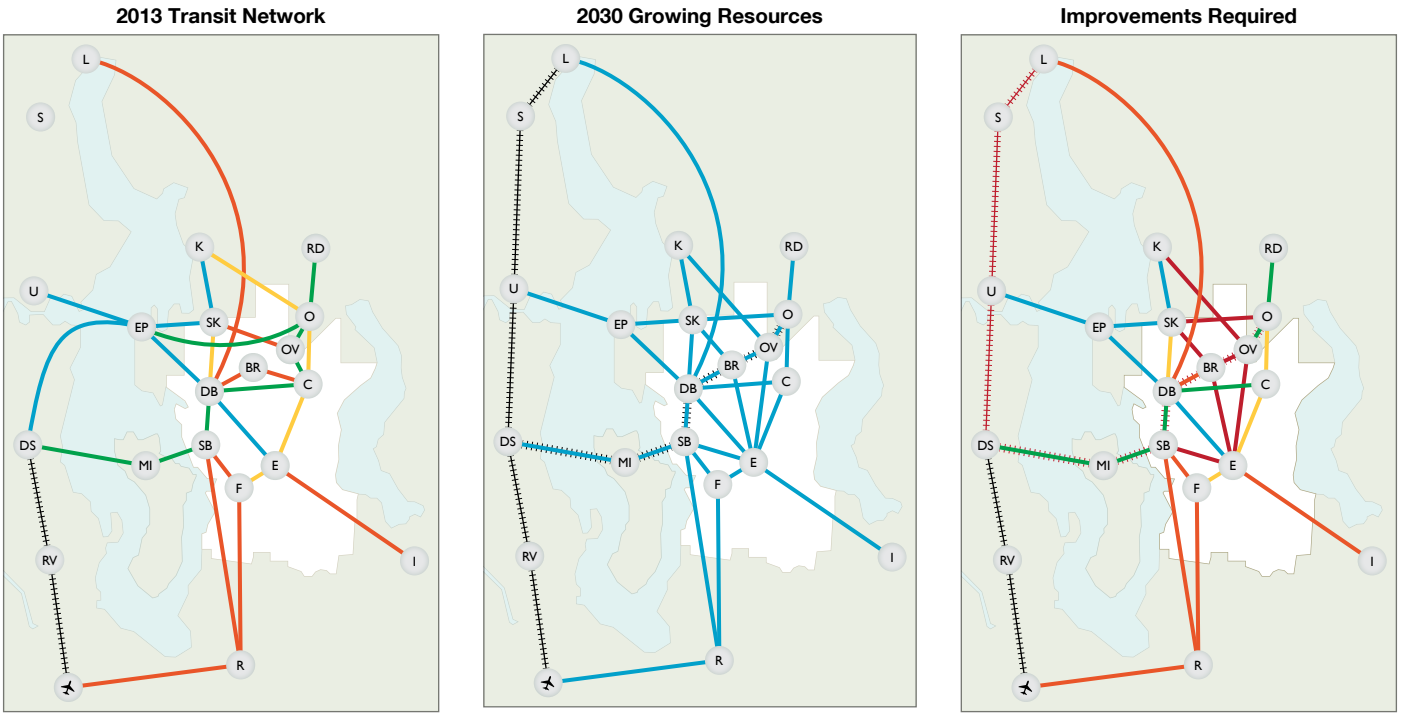
Transit-Oriented Development in Eastgate

WHY UPDATE THE 2003 TRANSIT PLAN?

On July 9, 2012, Council initiated the Bellevue TMP, an update of the City's 2003 Transit Plan. The TMP builds on the successes of the City's previous plan by considering current transit operations and performance, the priorities expressed by the public about the network, projected growth in population, employment, and ridership, and anticipated changes resulting from the introduction of East Link light rail and various planned and potential investments in roadway and transit infrastructure. Council charged the Transportation Commission with overseeing the update process with input from members of the Planning, Arts, and Human Services Commissions and the Parks and Community Services Board (see Project Principles, Appendix 2).

Draft

Figure 7 Progress toward the 2030 FTN by frequency of service connections between major centers.



Legend

BELLEVUE

- **BR** Bel-Red
- **C** Crossroads
- **DB** Downtown Bellevue
- **E** Eastgate
- **F** Factoria
- **SB** S. Bellevue Park & Ride

REGION

- **DS** Downtown Seattle
- **EP** Evergreen Point
- **I** Issaquah Transit Center
- **K** Kirkland Transit Center
- **L** Lynnwood
- **MI** Mercer Island
- **O** Overlake Transit Center
- **OV** Overlake Village
- **R** Renton
- **RD** Redmond Transit Center
- **RV** Rainier Valley
- **S** Shoreline
- **SK** S. Kirkland Park & Ride
- **U** University District
- SeaTac

	Peak	Midday	Night
Very Frequent (every train connection)	≤8	≤12	15-30
Infrequent	30	15-30	30-60
LRT			

Note: numbers reflect approximate peak/midday/night frequencies.

2013 - 2030 FTN Upgrades Required

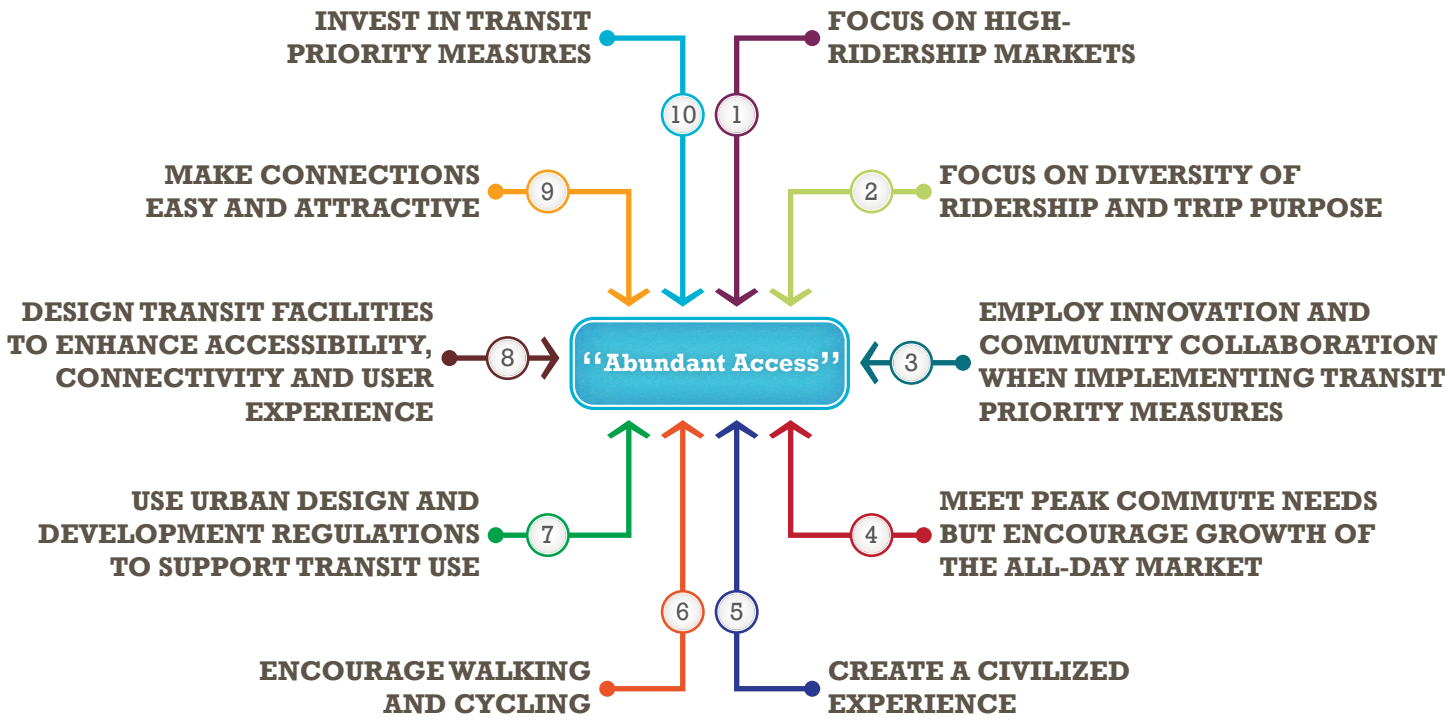
- 8 **No Upgrade Needed** - 2030 FTN-Level Service
- 10 **Upgrade by 2 min.** - Existing Very Frequent Service
- 15 **Upgrade by 7 min.** - Existing Frequent Service
- 30 **Upgrade by 20+ minutes** - Existing All-Day Service
- N **New Service** - No Existing Service at any Frequency

WHAT DOES THE TMP TELL US?

Informed by public input, technical studies, and market analyses, the TMP identifies service and capital investment priorities needed to establish a Frequent Transit Network that meets the travel needs of most Bellevue residents and workers (see Figure 7). The plan was developed with feedback from King County Metro and Sound Transit, whose partnership is critical to creating a seamless, fully-integrated, and user-friendly transit network in Bellevue. The plan presents a bold vision supported by practical, achievable strategies in the near term that establish a foundation for longer-term improvements through the 2030 plan horizon year. The TMP also provides guidance on how transit investments will be prioritized in the future, and contains performance measures that establish how the city will track progress made in accomplishing the goals of the plan over time.

Draft

Figure 8 The "Abundant Access" vision statement and supporting Market Driven Strategies.



WHAT DOES "ABUNDANT ACCESS" MEAN?

The TMP aims to: "Support planned growth and development with a bold transit vision that provides efficient, useful, attractive service for most people, to most destinations, most of the time, serving maximum ridership." This "Abundant Access" statement and supporting Market Driven Strategies—detailed in the Policy Element—supports Downtown growth, Bel-Red corridor redevelopment, and Bellevue's other activity centers with a well-connected Frequent Transit Network (FTN) that seamlessly interfaces with East Link light rail. The FTN is also where capital investments need to be focused to serve the most riders and provide the highest quality of service to people who travel to/from or within Bellevue.

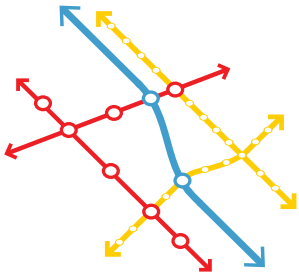
Draft

Figure 9 Goal statements reflecting what the "Abundant Access" vision statement aims to achieve.

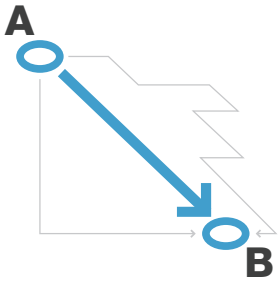
CONVENIENT, making it the logical choice for the largest possible share of trips.

FREQUENT, to minimize waiting times and improve connections.

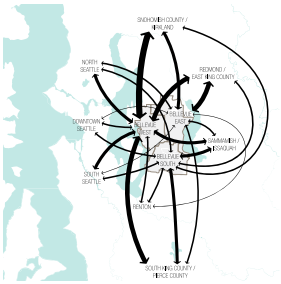
EFFICIENT, in terms of being designed for high ridership and cost-effective operations.



SIMPLE, with the fewest possible discrete lines, so that each can have the best possible frequency, speed, and duration without complicated redundancy.



DIRECT to major activity centers in Bellevue by minimizing the degree to which a route deviates from the shortest path between its start and end points.



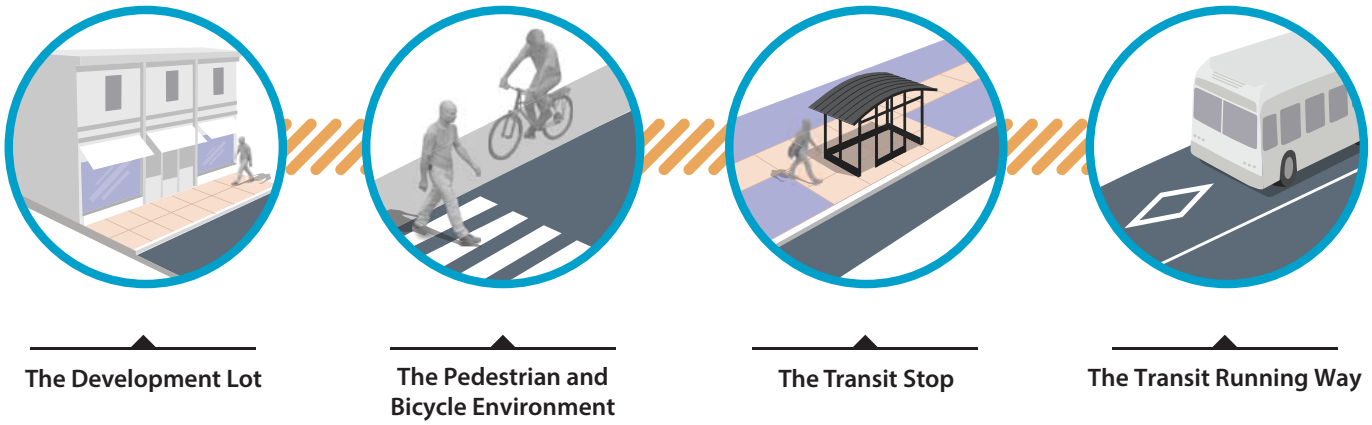
REGIONALLY CONNECTED, with a complete network of regional links in all directions, with particular focus on abundant north-south service along I-405.

WHAT ARE THE SERVICE-ORIENTED STRATEGIES?

On May 20, 2013, the Bellevue Council approved a set of service-oriented strategies that lead to a vision of "Abundant Access" which means guiding additional transit service to/from Bellevue's major activity centers where transit demand is high and expected to increase in the future. We recognize that this approach of maximizing the return on investment of limited resources has an impact on coverage routes in Bellevue's lower density residential areas where service is less productive. Participants in the TMP outreach effort overwhelmingly agree that if service reductions are necessary, Metro should delete commuter routes operating empty in the counter-flow direction and low performing coverage routes before impacting high demand FTN corridors. Consistent with this guidance, the Service Element details route-level recommendations for nine funding/ time-horizon scenarios that align with the TMP's vision statement and service-oriented strategies.

Draft

Figure 10 Areas related to transit capital facilities over which the City of Bellevue has influence.



WHAT ARE THE CAPITAL-ORIENTED STRATEGIES?

The TMP recognizes that, although the City does not operate its own transit service, it has an influence over how well transit services perform along FTN corridors. This includes influencing demand for transit by co-locating appropriate land uses to transit services, connecting pedestrians and bicycles to the transit network, providing convenient, safe, and comfortable transit stops and commuter parking facilities, and maintaining roadways, traffic signals, and other infrastructure that supports efficient and reliable operations. Informed by public input, technical studies, and market analyses, the Capital Element recommends investments that will help the City realize its proposed 2030 FTN thereby enabling more people, to reach more destinations, in less time. All of these projects have been ranked as high, medium, or low priority depending on the value they bring to improving transit speed and reliability on FTN corridors. The project prioritization presented in the TMP is the first step in the multi-stage process from transportation project inception to implementation. To move these projects forward to construction, transit capital investments will still have to compete with other infrastructure priorities identified in other Long Range Facility Plans before they are incorporated into Bellevue's Transportation Facilities Plan and then Capital Investment Program.

PHOTO BY Shane Valle

SECTION 1: BACKGROUND

Draft

INTRODUCTION

PLAN PURPOSE

Bellevue's *Comprehensive Plan* acknowledges that responding to anticipated growth in travel necessitates a multi-modal transportation solution that offers the public real choices about how they travel within, to, from, and through Bellevue. Looking to the future, the Bellevue City Council envisions a public transportation network that serves a more diverse range of people and trip purposes, and that is the mode of choice for an increasing number of people who live, work, and play in Bellevue. Council's perspective on transit is reflective of the values expressed by members of the community. According to the 2014 Budget Survey, 90 percent of Bellevue residents agree or strongly agree that the City should "work with regional agencies to improve local and regional public transportation serving Bellevue"—up from 83 percent in 2012 (see Figure 13).

The role of transit in Bellevue is evolving, and this plan is part of that process. On July 9, 2012, Council initiated the Bellevue Transit Master Plan (TMP), an update of the City's *2003 Transit Plan*. The TMP builds on the successes of the City's previous plan by considering current transit operations and performance, the priorities expressed by the public about this network, projected growth in population, employment, and ridership, and anticipated changes resulting from the introduction of East Link light rail and various planned and potential investments in roadway and transit infrastructure.

Council charged the Transportation Commission with overseeing the update process with input from members of the Planning, Arts, and Human Services Commissions and the Parks and Community Services Board (see Project Principles, Appendix __). This project also benefitted from the active involvement

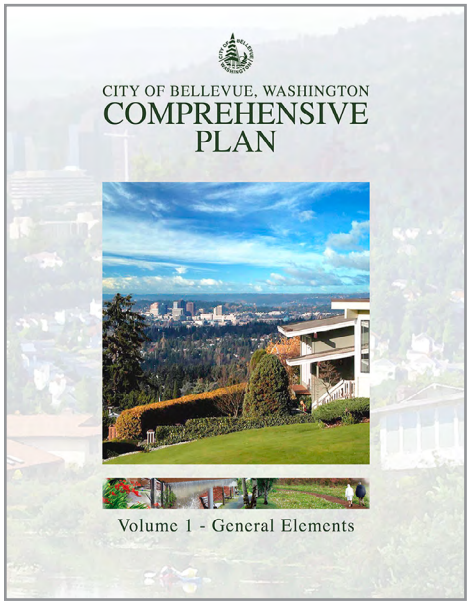


Figure 11 Bellevue's Comprehensive Plan, currently undergoing its decennial update, includes a variety of policies that promote transit operations in the city.

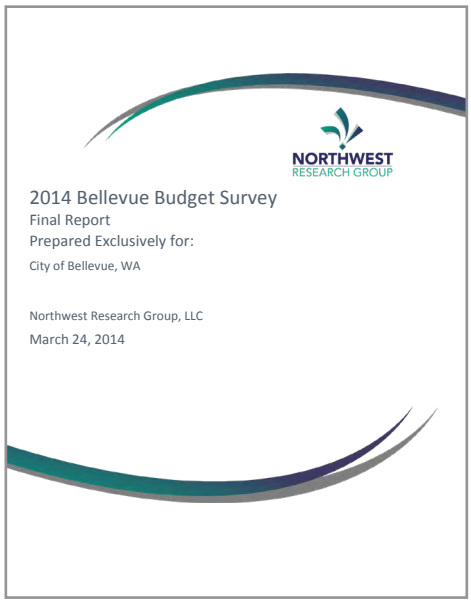


Figure 12 In the 2014 Budget Survey—and all previous City budget survey efforts—public support for transit consistently ranks the highest across an array of transportation strategies on how to handle traffic and congestion in Bellevue.

Draft

and support of residents, business owners, and the workforce as well as numerous institutions and agencies, such as Bellevue College, Sound Transit, King County Metro, and adjacent jurisdictions. As indicated in Figure 13, these diverse groups collectively spoke of the many ways that transit benefits Bellevue (see the *Benefits of Transit Report* for details), including:

- **Economic Benefits** – Businesses, especially large employers, frequently locate in communities with strong public transit services;
- **Environmental Benefits** – Cities benefit from reduced traffic congestion and improved air quality when people take transit;
- **Community Benefits** – Since transit requires less land and energy than the private car to move the same number of people, it is often cheaper to meet mobility needs with transit rather than through other measures such as road widening or new parking facilities;
- **Individual Benefits** – Public transportation provides an affordable, and for many, necessary, alternative to driving.

The Transit Master Plan aims to maximize these benefits for Bellevue by coordinating with local and regional transit efforts to identify the types of service and capital features required to meet Bellevue's needs today and through 2030.

"Speaking from a corporate perspective, we couldn't provide mobility to our workforce without a robust transit system in Bellevue."

– JIM STANTON, SENIOR COMMUNITY AFFAIRS MANAGER, MICROSOFT

Figure 13 Efficient, useful, well-utilized public transit provides a variety of benefits, summarized here in four broad categories: benefits to the economy, environment, community, and individuals.

Draft

PLANNING PROCESS

The Transit Master Plan Summary Report is the result of a two year-long process undertaken by the Transportation Department to comprehensively understand the current state of fixed-route bus transit service in Bellevue and plan for the city's anticipated needs in the years ahead. This process included extensive outreach to the community, consultation with local stakeholders and transit agencies officials, and an assortment of technical analyses in support of transit service and capital planning. More specifically, the TMP process included:

- Compilation and analysis of existing fixed-route bus transit network performance statistics;
- Examination of current and future market conditions and projected travel demand by mode;
- Outreach to the public, city boards and commissions, and other local stakeholders to elicit the perspectives and service priorities of various groups;
- Consultation with local transit officials to ensure that the proposals ultimately advanced reflect adopted service guidelines, multi-modal integration plans, and the realities associated with potential transit funding situations in the coming years;
- Consideration of a wide variety of potential projects, both new and those previously identified by other planning efforts, to determine where and how City investments can help make transit operations faster and more reliable;
- Examination of other components of the transit trip over which the City has influence, including the development lot, pedestrian and bicycle environment, and transit stop, to determine where investments can be made to improve the transit user's experience and attract additional ridership.

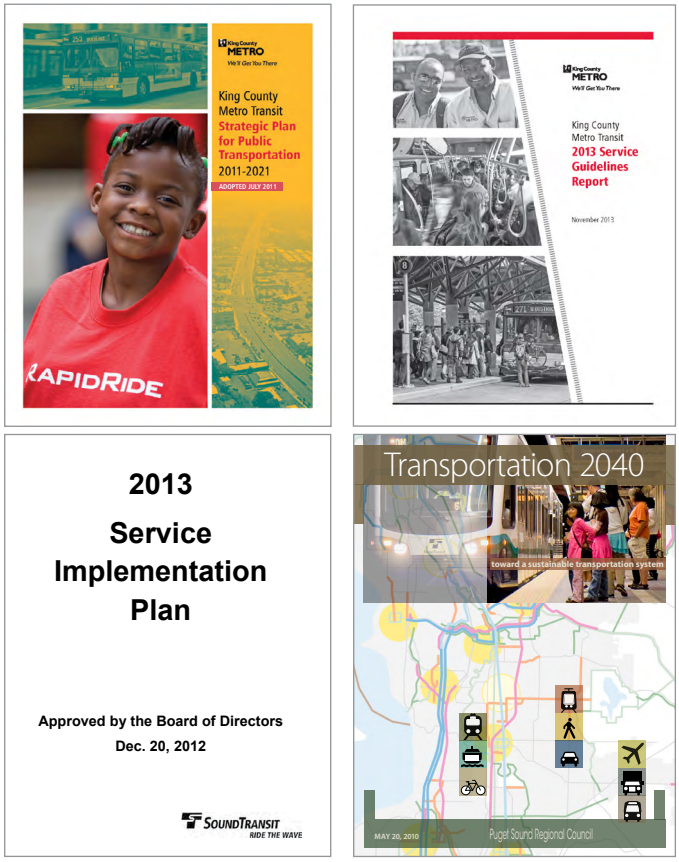


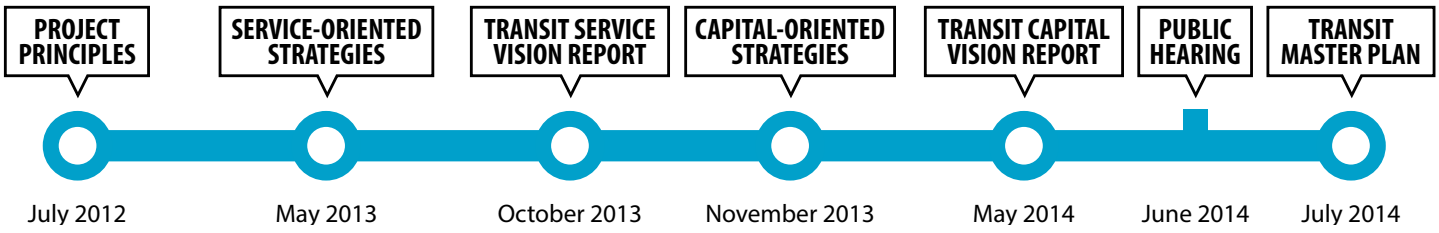
Figure 14 All of the reports compiled by the City of Bellevue in support of the Transit Master Plan derive data from and strive for consistency with documents published by King County Metro, Sound Transit, and the Puget Sound Regional Council, including the *Strategic Plan for Public Transportation 2011-2021*, *Service Guidelines Reports*, the *2013 Service Implementation Plan*, and *Transportation 2040*.

Draft

To date, the Transportation Department has published an assortment of documents describing each stage in the overall TMP process. All of these documents, briefly summarized in Appendix 1 on page 104, are available to view and download at www.bellevuewa.gov/transit-plan-documents.htm. These efforts were generally organized into two separate but closely related processes: the Service Element and the Capital Element (see Sections 3 and 4, respectively). Both leveraged technical analyses and input obtained from community outreach to arrive at the service- and capital-oriented strategies, as indicated by Figure 16 and Figure 17 on the following pages. Collectively referred to as the market-driven strategies, these define the priorities of the "Abundant Access" vision statement—addressed in greater detail in the Policy Element (see Section 2)—which guided the development of the service and capital visions. Reports associated with these strategies and visions represent the most significant milestones of the TMP planning process, as shown in Figure 15.

The TMP planning process began with an assessment of the fixed-route services provided by the existing transit network and how well they perform, outreach to determine the attitudes and preferences of the community related to transit, and projections of future travel demand within Bellevue and between Bellevue and other regional markets. As shown in Figure 16, the results of these endeavors served as inputs in the development of the service-oriented strategies. These strategies consider the

Figure 15 Transit Master Plan timeline of project milestones.



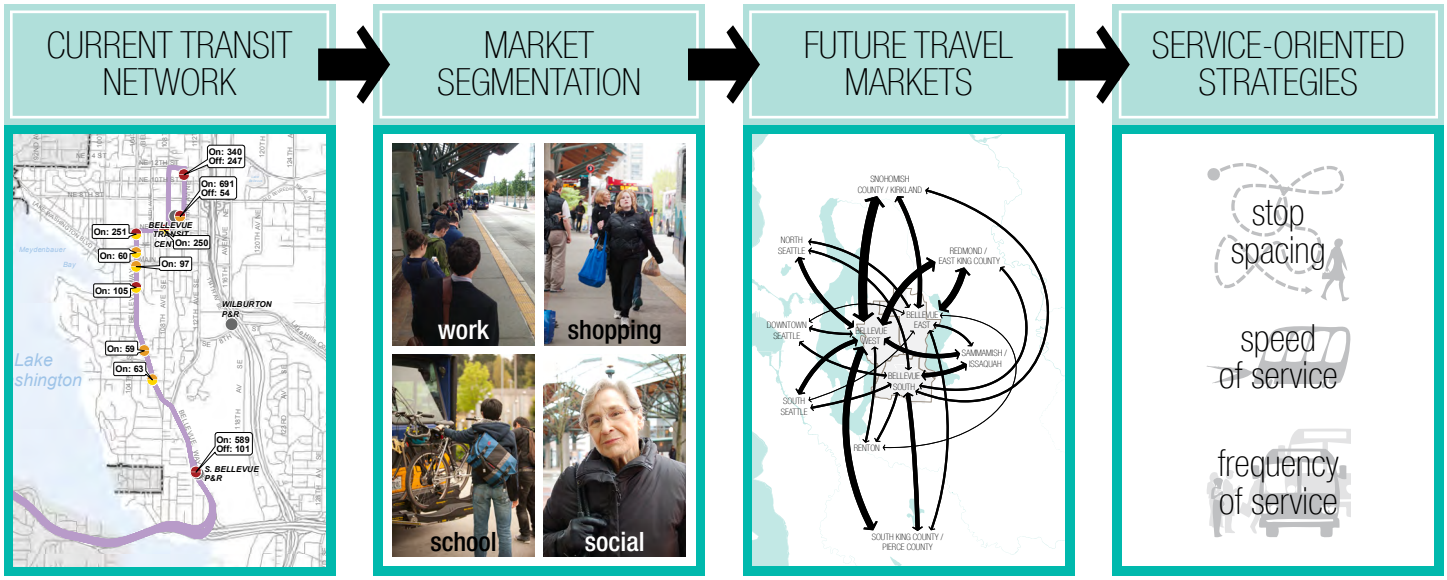
Draft

fundamental tradeoffs associated with operating transit service and advance the priorities believed to best reflect the city's needs and the preferences identified by the community.

The transit service vision uses these strategies as its guide and presents route-level recommendations that are responsive to different financial scenarios (reduced, stable, and growing Resources) and attune to different time horizons (2015, 2022, and 2030). These nine networks were created to plan for the uncertainty that exists in the financial outlook of transit while incrementally guiding network development toward the aspirational 2030 Growing Resources network to the extent possible with available funding.

The 2030 Frequent Transit Network (FTN) represents the core of the services envisioned in the Growing Resources scenario and includes all routes operating 8–12 minute headways all-day (see Figure 1). Because these routes will provide the primary connections between local and regional activity centers and serve the most ridership, corridors served by the FTN are the most important to target for capital investments that would improve service speed and reliability, pedestrian and bicycle access to transit, and other infrastructure improvements.

Figure 16 This graphic describes the Service Element planning process, which arrived at six service-oriented strategies based on a detailed review of the current transit network, an assessment of the attitudes and preferences that drive traveler choices, and an evaluation of future travel markets.



What service types are in place today and how well do they perform?

What are the attitudes and preferences that drive traveler choices?

Which segments in which travel markets should transit services compete for?

What kinds of strategies can best seize these opportunities?

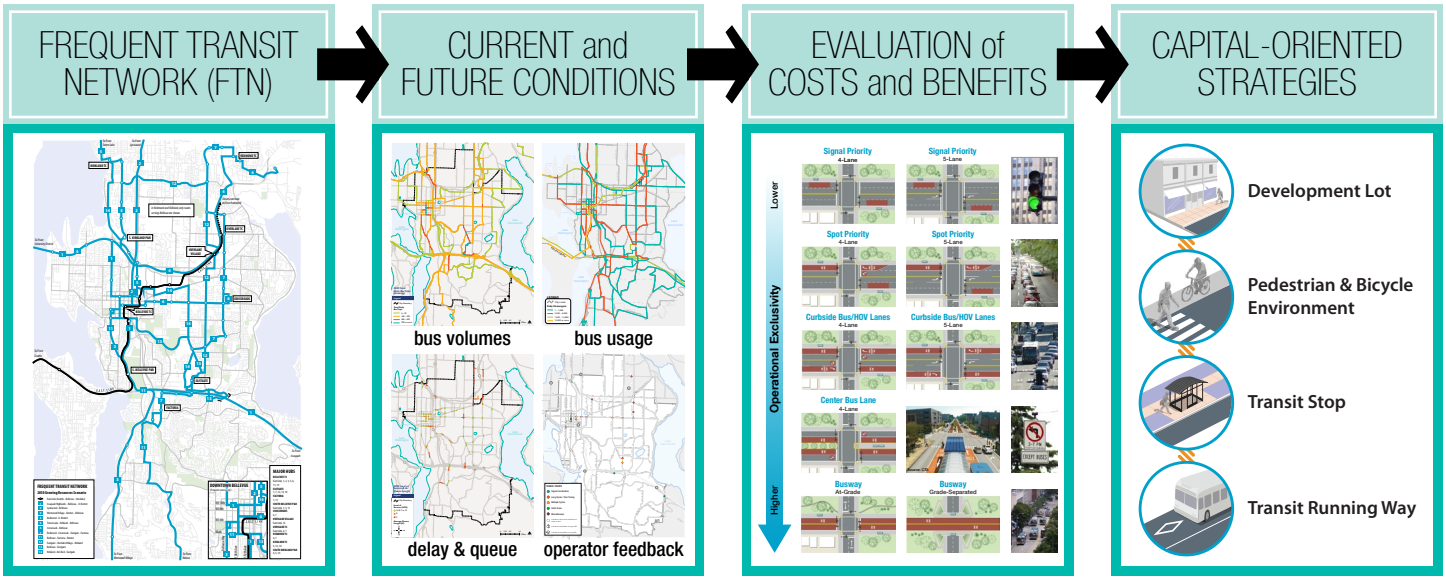
Draft

Therefore, as shown in Figure 17, the FTN served as the starting point for all analyses conducted as part of the Capital Element.

The capital-oriented strategies were developed based on assessments of the current and future conditions along FTN corridors, input obtained from community outreach efforts, and consideration of the types of improvements that could influence the public's decision to use transit. The capital vision reflects these priorities, identifies the various types of infrastructure that support productive, accessible, efficient transit services in Bellevue, and recommends investments that would help the City realize and maximize the performance of the 2030 FTN.

Whereas the Service and Capital Elements were addressed in succession, with the latter building on the outcomes of the former, the Policy Element section in this report represents a compilation of all the strategy and policy considerations addressed by the Transit Master Plan, which were identified at various stages of the TMP planning process to provide guidance to the other two elements and the overall planning effort. Because these strategies and policies serve as the framework upon which the rest of the plan is based, the Policy Element precedes the Service and Capital

Figure 17 This graphic describes the Capital Element planning process, which arrived at four Capital-Oriented Strategies based on an assessment of current and future conditions on corridors served by the 2030 Frequent Transit Network, identified by the growing resources scenario of the service vision, and an evaluation of the costs and benefits of various potential transit priority infrastructure investments.



Where is bus service expected to be convenient, reliable, easy-to-use?

What are the current and future conditions on FTN corridors?

What are the costs and benefits of different levels of operational exclusivity?

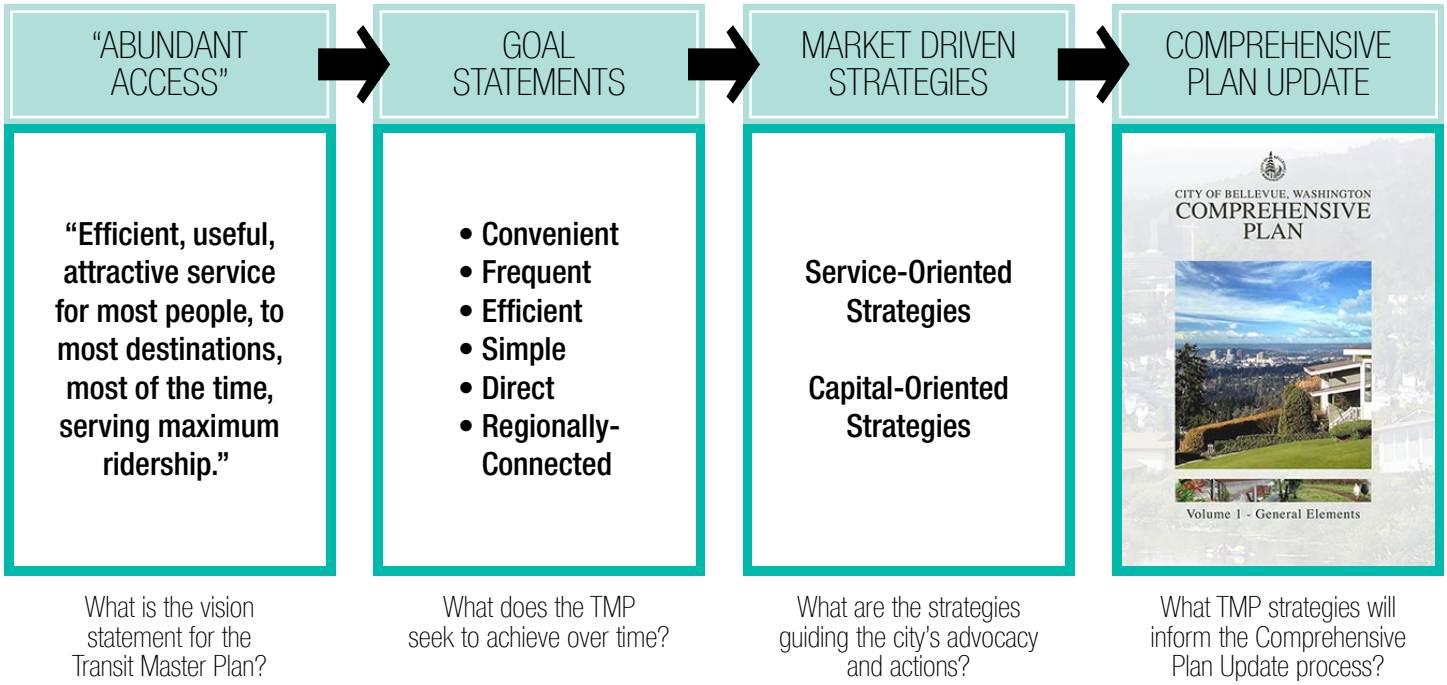
What strategies can influence the public's decision to use transit?

Draft

Elements in this report.

Before presenting the service and capital visions, it is instructive to first review some of the Transit Master Plan's more significant foundational materials. The resulting vision is meant to be a logical extension of the principles established by City Council, the opinions expressed by the public, and the priorities identified by various officials, representatives, and other stakeholders throughout the planning process. The following pages describe the community input that guided all aspects of this planning effort, followed by a brief summary of the current state of fixed-route transit in Bellevue and the projected changes in land use, population, employment, and ridership on which the need for changes to and investment in the future network is based.

Figure 18 This graphic describes the structure of the Policy Element, with the "Abundant Access" vision statement and goals leading to market-driven strategies that inform both the service and capital visions and the Comprehensive Plan Update process.



Draft

COMMUNITY OUTREACH

Analysis of existing and future conditions can help to inform where and how resources might reasonably be allocated to achieve productive and efficient services; however, such analysis only provides guidance, not definitive answers. Situations frequently arise in which decisions must be made about competing interests of comparable merit that simply reflect different perspectives. Given limited resources, often only one solution can be pursued. Careful consideration must therefore be given to how alternative courses of action would address the values and interests of the end-users of the transit system—the public.

To that end, the Transit Master Plan obtained input from the community through a variety of means, each of which provided direction for the Policy, Service, and Capital Elements. The earliest and most expansive outreach was conducted via the web-based Transit Improvement Survey, which generated input from over 4,200 respondents—of which nearly 1,100 are Bellevue residents—including current riders, former riders, and those who have never used transit in Bellevue. To facilitate input from recent immigrants and other non-native English speakers, comment cards were distributed to local human services agencies in multiple languages, including Chinese, Russian, and Spanish. Video interviews were conducted with several individuals representative of some aspect of the community, and voluntary surveys were distributed to coach operators to obtain their perspective about common issues affecting transit in Bellevue. Businesses and organizations were also encouraged to provide their perspectives on transit service in Bellevue, and many did so directly by submitting letters to the City and indirectly by encouraging their employees and members to complete the Transit Improvement Survey.[1]

1 Refer to the *Phase 1 Outreach Report* for translated results of the non-Enligh comment card outreach, video interview transcriptions, letters obtained from businesses and organizations, and the complete results of the responses received to the Transit Improvement Survey.

Figure 19 Postcard advertising the Transit Improvement Survey.

Figure 20 A participant in the outreach to non-native English speakers and her completed comment card.

Figure 21 Coach operators identified transit operations issues in Bellevue related to safety, speed, and reliability.

Draft

Finally, the Transportation Department solicited the perspectives of City board and commission members, transit agency representatives, and representatives from other community stakeholders by engaging them at three workshops held at various stages of the TMP process. These events served as valuable forums for evaluating the tradeoffs among competing service and capital investment decisions inherent to transit and advancing policies reflective of the perspectives obtained from the community at large.

Transit Improvement Survey

The Bellevue Transit Improvement Survey was conducted between February and March of 2012. The survey addressed all aspects of transit use and user experience in Bellevue, answering the broad questions: Who uses transit in Bellevue and how? How do people perceive various qualities about transit service in Bellevue? What are peoples' priorities for transit service in Bellevue? Some of its most significant outcomes include the identification of (1) common characteristics of transit use in Bellevue by trip purpose, places of origin and destination, and demographic characteristics, (2) the factors that most influence individuals' decision to use (or not use) transit in Bellevue, (3) the qualities of service that are most important to current and potential transit users, and (4) the community's priorities for municipal investment in transit, advocacy to transit agencies, and preferred solutions in the event of service reductions resulting from diminished resources.[2]

Commuting to/from work is the most common trip purpose among transit users in Bellevue (see Figure 23), but more than three-quarters of all respondents use transit for more than one trip purpose. Almost regardless of trip purpose, transit users selected the same three qualities of service

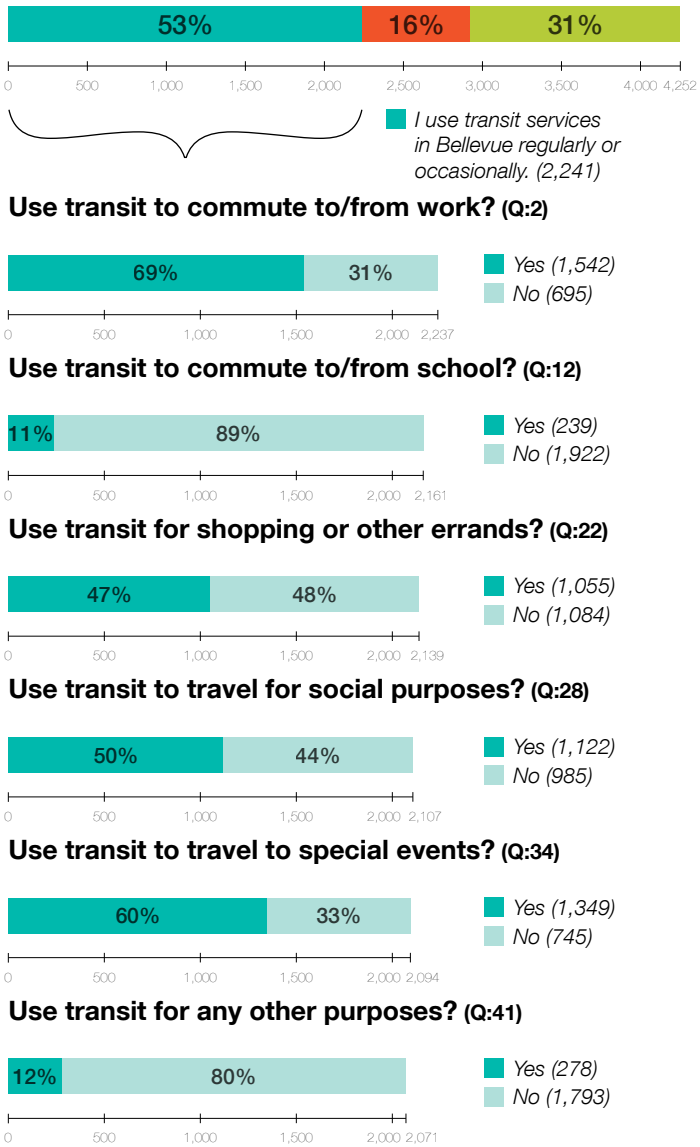
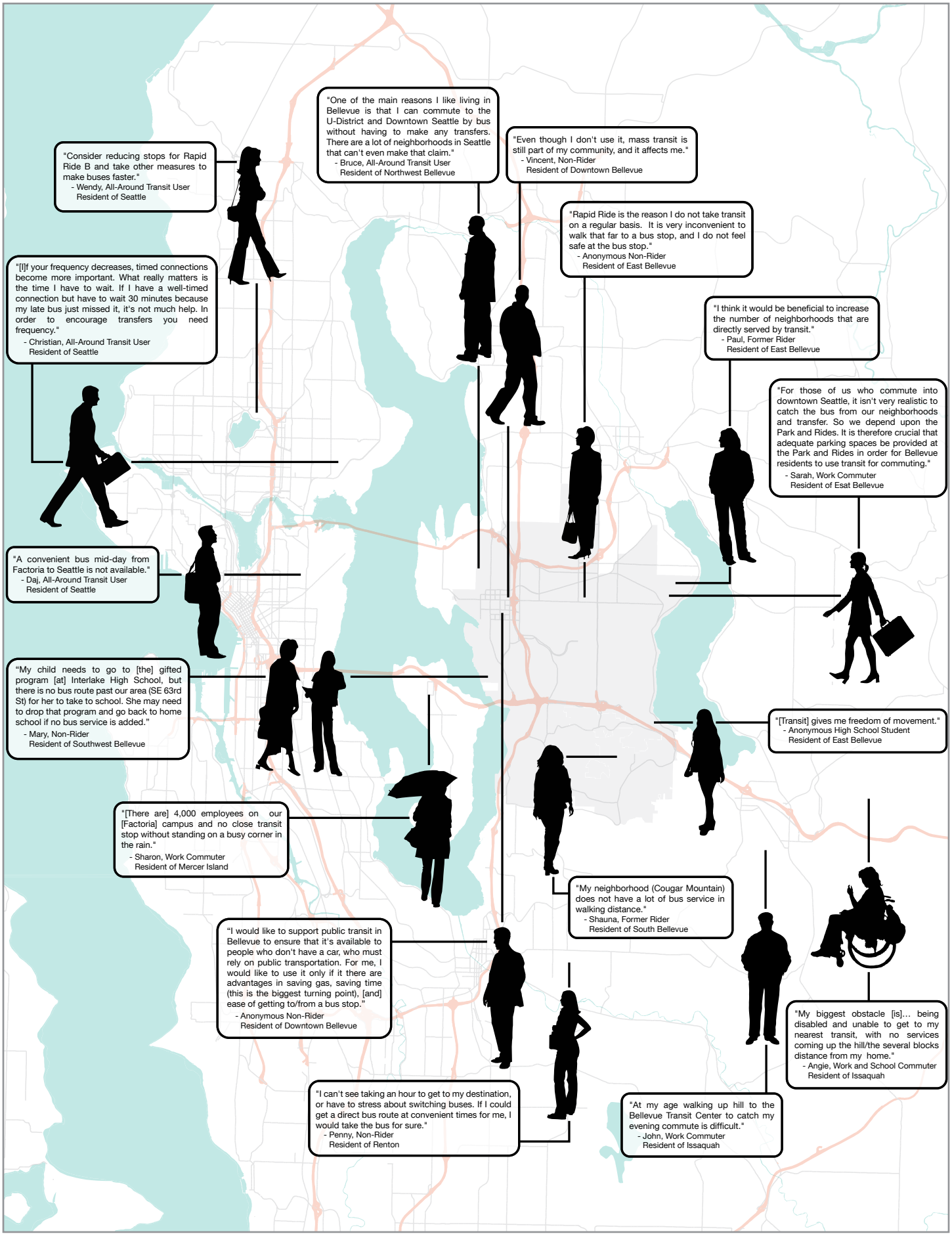


Figure 23 Trip purpose(s) of the 2,241 respondents who identified themselves as current users of transit in Bellevue.

2 Refer to the *Transit Improvement Survey Report* for a thorough review of the results obtained.

Figure 24 Selected write-in comments provided by Transit Improvement Survey respondents.

Draft



Draft

Table 1 Advocacy priorities of respondents who currently use transit in Bellevue.

	All Respondents		Bellevue Residents	
Quality of Service	Count	Percent	Count	Percent
Increase Frequency During Peak	643	33.2%	149	22.8%
Increase Frequency to Reduce Overcrowding	249	12.9%	74	11.3%
Increase Vehicle Capacity at Park & Rides	183	9.5%	65	9.9%
Other	168	8.7%	54	8.3%
Increase Frequency During Midday	152	7.9%	58	8.9%
Revise Schedules to Improve Connections	131	6.8%	44	6.7%
Expand Service Coverage in Bellevue	114	5.9%	71	10.9%
Install Additional Shelters	60	3.1%	30	4.6%
Increase Frequency on Weekends	50	2.6%	30	4.6%
Extend Service at Night on Weekends	48	2.5%	20	3.1%
Increase Frequency During Late Night	47	2.4%	22	3.4%
Expand ORCA Sales Locations in Bellevue	41	2.1%	18	2.8%
Extend Service at Night on Weekdays	32	1.7%	13	2.0%
Increase Bicycle Capacity at Park & Rides	18	0.9%	6	0.9%
respondents	**1,936**		**654**	

Figure 25 Half of all work commuters who responded to the Transit Improvement Survey cited increased productivity and/or relaxation as a reason for choosing to use transit instead of driving.

as their three highest priorities: (1) the frequency of weekday service, (2) schedule reliability and on-time performance, and (3) the speed of service. A perception that traveling by transit takes too long is the most common reason why former riders no longer use transit and why non-riders have never used transit, and both former and non-riders cite lacking service frequency among their top three reasons for not using transit.

When asked how the City could best leverage its influence with local transit agencies to improve service in Bellevue, respondents emphasized improving frequency during peak hours, which received more than twice as much support as the second-highest priority of reducing overcrowding. Bellevue residents are more likely than respondents overall to support advocacy for increased frequency throughout the day and expansion of service coverage into un-served Bellevue neighborhoods. Park-and-ride vehicle capacity is also considered to be inadequate and worthy of advocating for additional investment. When asked how the City should invest municipal resources to improve transit, current transit users' three highest priorities were to (1) invest in roadway and transit signal infrastructure to improve transit speed and reliability, (2) provide real-time arrival information at major stops, and (3) increase vehicle parking capacity at park-and-ride lots (see Table 1). Finally, when asked how to address a hypothetical future budget shortfall, respondents tended to favor revenue-increasing solutions over service reduction solutions. When considering the difficult choices associated with reduced funding and service cuts, Transit Improvement Survey respondents overwhelmingly agreed that if service reductions are necessary, Metro should eliminate low-performing coverage routes before impacting off-peak service frequency or span of service at night, both of which received little support.

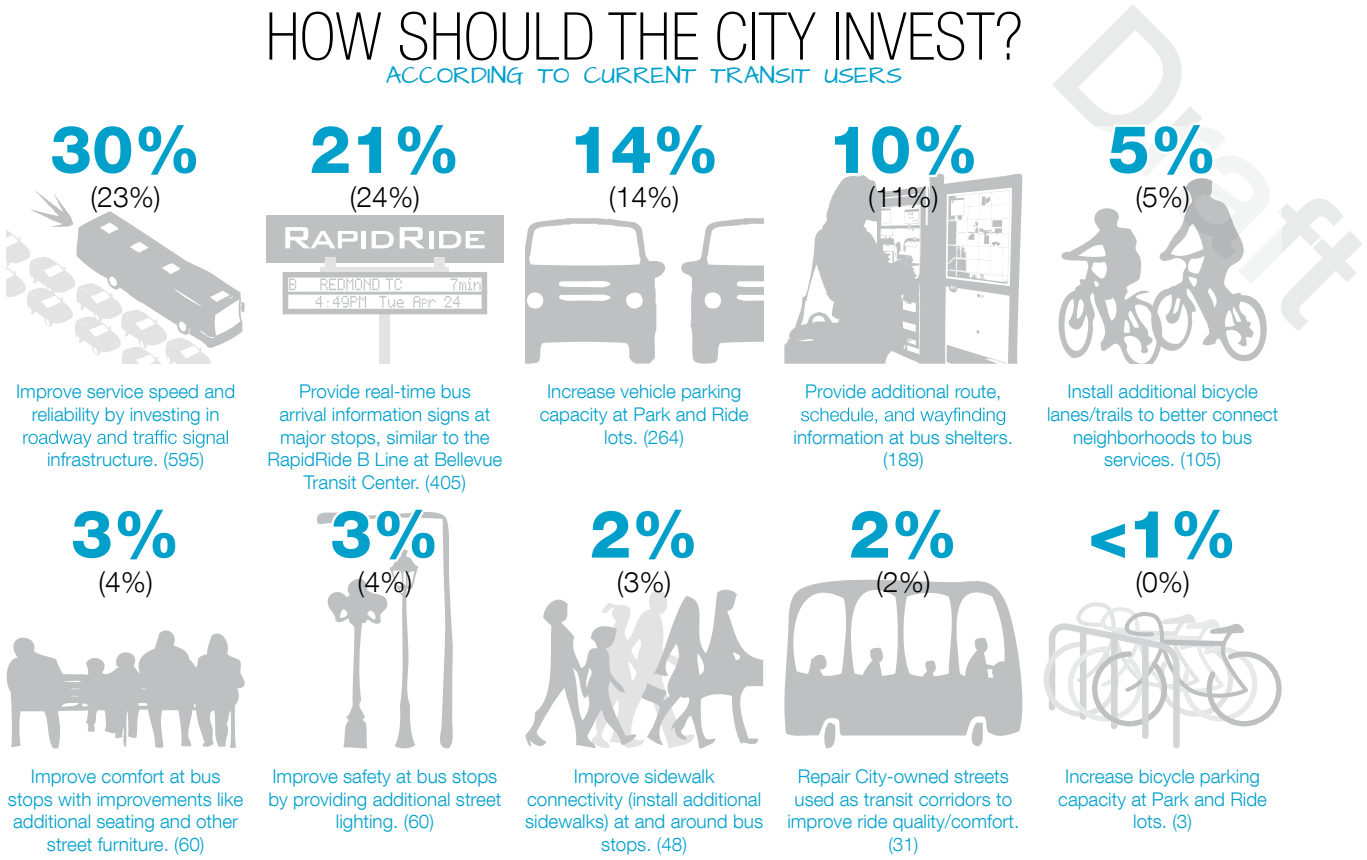


Figure 26 Priorities for municipal investment in transit among those who currently use transit services in Bellevue, according to the Bellevue Transit Improvement Survey. Large blue percentages reflect all current transit users, small black percentages in parentheses reflect all current transit users who reside in Bellevue, and small blue numbers in parentheses following each description reflect the total number of respondents.

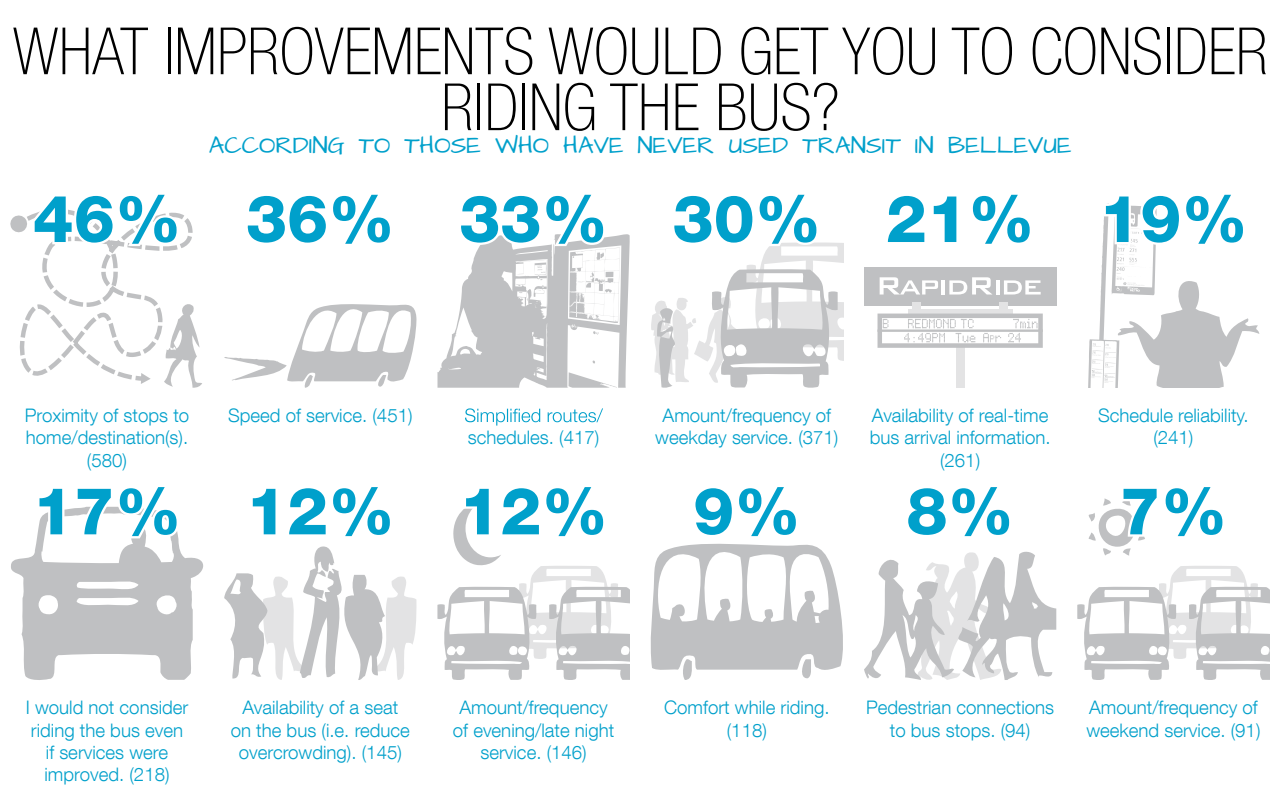


Figure 27 Factors that would encourage those who have never used transit services in Bellevue to consider doing so, according to the Bellevue Transit Improvement Survey. Large blue percentages reflect all current transit users; small blue numbers in parentheses following each description reflect the total number of respondents.

Figure 28 Comments from selected stakeholder interviews.

"The October 2011 service changes are absolutely great... I love the B Line. I love that Route 245 from Factoria to Kirkland via Sammamish High School and Crossroads now runs every fifteen minutes. I don't need to look at a schedule before I take the bus. I love that unproductive routes were deleted in favor of more productive routes that serve more people."

– DANIEL WARWICK, STUDENT AT INTERLAKE HIGH SCHOOL

"I'm a returning student full time, and I'm disabled as well. So, it's just much better economically to use the transit versus owning a car, with insurance and gas costs."

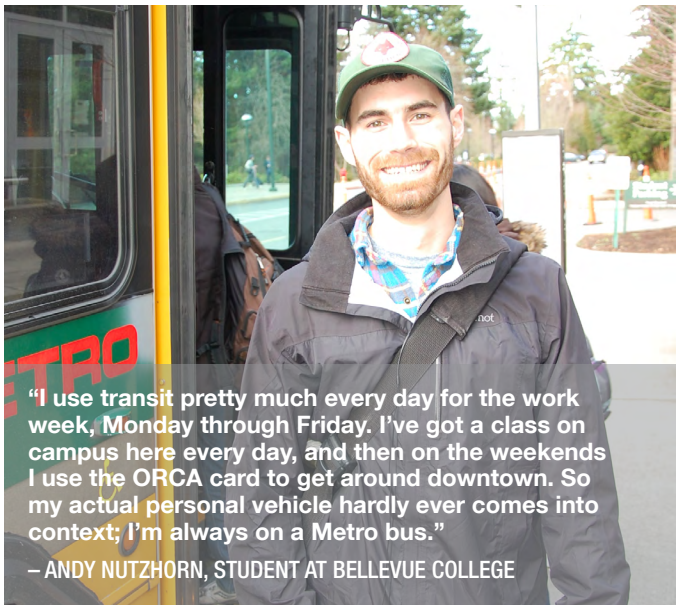
– ANGIE CHANDLER, BELLEVUE RESIDENT

"I can't drive—so the transit system is my main source of transportation. I use the bus service in Bellevue for volunteering and going to see my friends."

– MARJ LEIDY, BELLEVUE RESIDENT

"Transit is very important to me. I live in Kirkland and I come here to the Division of Vocational Rehabilitation in Bellevue at least three or four times per week to get some training to get back to work."

– TIM STEINERT, KIRKLAND RESIDENT



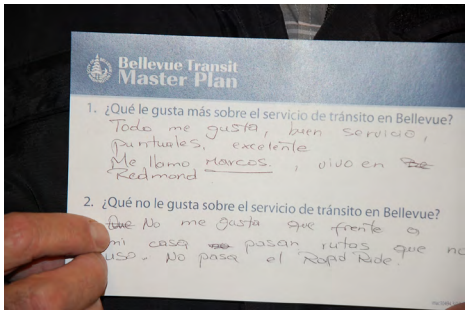
"I use transit pretty much every day for the work week, Monday through Friday. I've got a class on campus here every day, and then on the weekends I use the ORCA card to get around downtown. So my actual personal vehicle hardly ever comes into context; I'm always on a Metro bus."

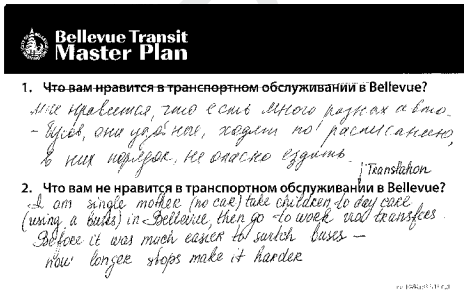
– ANDY NUTZHORN, STUDENT AT BELLEVUE COLLEGE

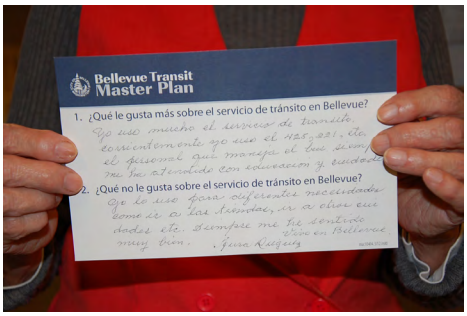
"I can't see well enough to drive, and physically I can't—my back is really too bad at this point to drive, even if my eyes were good enough, which they are not. It would not be safe for me to drive."

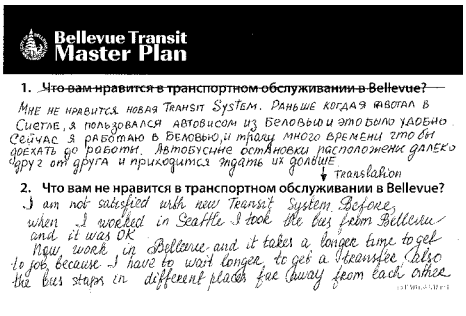
– STACEY DUNN, BELLEVUE RESIDENT

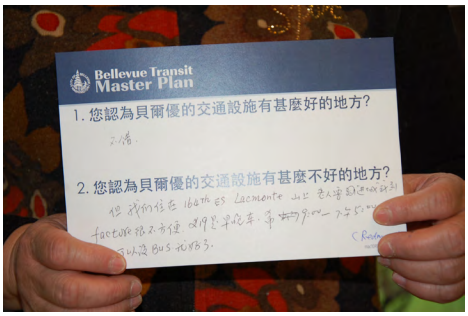
Figure 29 Some of the Chinese, Spanish, and Russian comment cards submitted by participants in outreach to non-native English speakers.

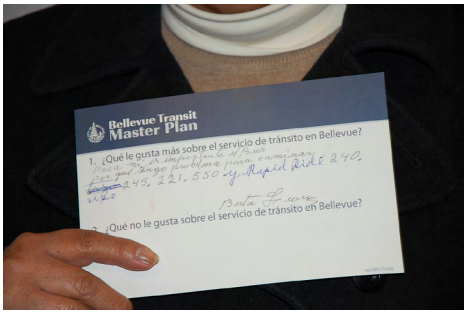


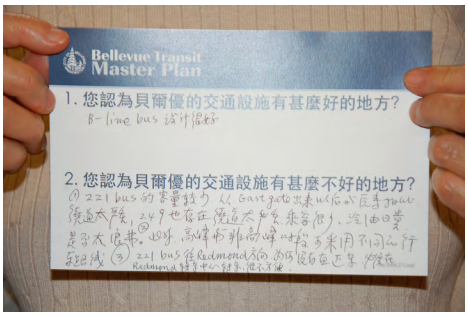


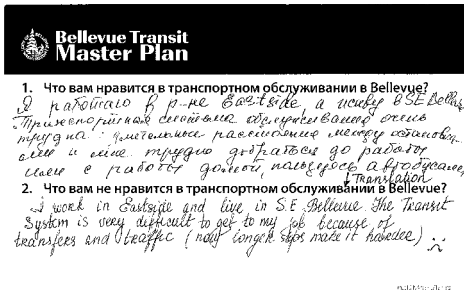


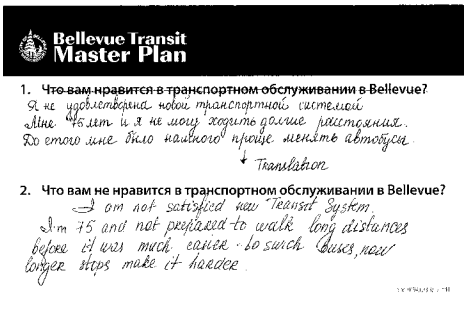


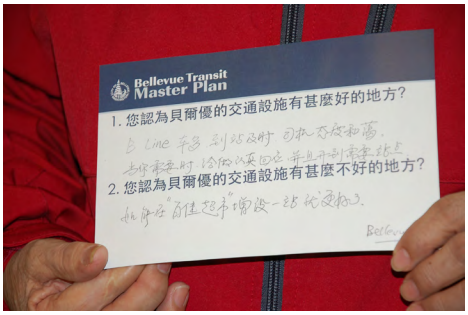


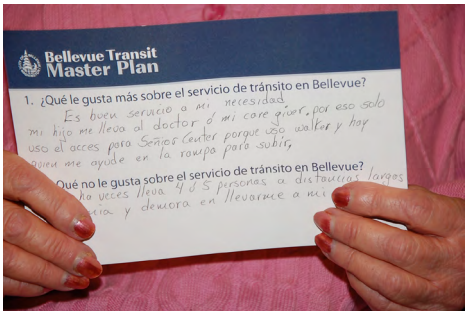


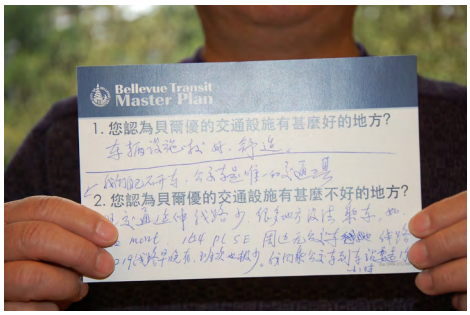


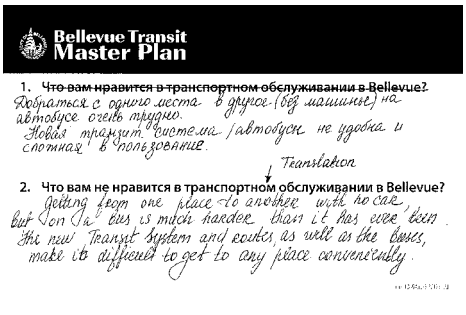












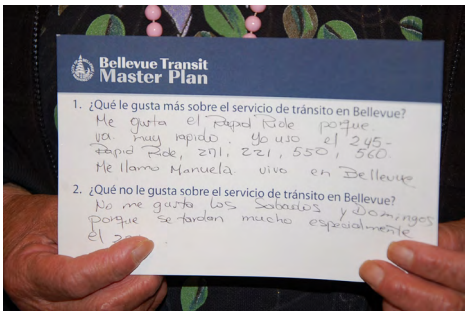


Figure 30 Numerous organizations submitted letters to the City and/or were interviewed to provide input to the Transit Master Plan.

"Employees at our headquarters in Bellevue documented on RideshareOnline.com savings of over 35 metric tons of CO2 Equivalent in 2013 through alternative commuting. With continued investment in transit infrastructure, we believe the already strong, positive environmental impacts of our alternative commuters could be increased dramatically, year after year."

CHI PAK, SEN. MANAGER OF CORPORATE SUSTAINABILITY, T-MOBILE USA, INC.

"During the school year, over 3,000 Bellevue School District high school students access metro transit as their primary mode of transportation to and from school. Our students depend on reliable, consistent and timely mass transit between their neighborhoods and schools to arrive to school on time and ready to learn."

TERRY PARKER, TRANSPORTATION MANAGER, BELLEVUE SCHOOL DISTRICT

"Bus travel to and from downtown Bellevue from employment centers to homes, and parts in between, helps employees, residents, and business patrons move Bellevue's economy forward."

BETTY NOKES, PRESIDENT AND CEO, BELLEVUE CHAMBER OF COMMERCE

"Abundant transit and great overall mobility are key strategies to support the growth of our thriving and livable downtown."

PATRICK BANNON, PRESIDENT, BELLEVUE DOWNTOWN ASSOCIATION

"People with disabilities must have accessible and reliable public transportation in order to work and be productive members of their communities. When people with disabilities work, lives of isolation and poverty are transformed into lives of inclusion and self-sufficiency. When people with disabilities work, businesses experience increased profits and higher employee satisfaction and morale. People with disabilities who have jobs pay taxes, support our economy, and no longer rely upon other social services to survive."

CHRISTINA BRANDT, CHIEF EXECUTIVE OFFICER, AtWork!

"With transportation accounting for nearly 47 percent of our communities' greenhouse gas emissions in Washington state, policies that accelerate energy-efficient transit choices and transit ridership will be a key part of the solution to reduce transportation-related GHG emissions."

ANDY WAPPLER, VP OF CORPORATE AFFAIRS, PUGET SOUND ENERGY

"The dramatic increase in the senior population over the next two decades highlights the need for a transportation system where mobility choices and access to services are provided equally and affordably to all residents and are responsive to the needs of people for whom transit is a necessity, including seniors, people with disabilities, low-income populations, youth, people of color, people with limited proficiency in English and people without access to private vehicles. The transit system should ensure that all people have access to mobility options that allow them to move freely around the community, preserve dignity, maximize independence and provide access to the full range of activities that contribute to quality of life."

PAULA L. HOUSTON, CHIEF EXECUTIVE OFFICER, SENIOR SERVICES

"Nearly a third of our students ride transit as their primary mode of transportation, which alleviates congestion in our neighborhood and throughout Bellevue."

RAY WHITE, VP ADMINISTRATIVE SERVICES BELLEVUE COLLEGE

"Our Children's Bellevue Clinic and Surgery Center is a significant trip generator in downtown Bellevue, attracting over 250 patients and their families and over 100 employees and volunteers daily. Patients and staff arrive throughout the day - not just at peak times. It is critical that the frequency and span of transit service on Bellevue's most productive corridors be maintained which is consistent with Children's travel demand."

PAULO NUNES-UENO, DIRECTOR OF TRANSPORTATION & SUSTAINABILITY, SEATTLE CHILDREN'S HOSPITAL

"Proximity to the variety of transportation options that the Bellevue Transit Center provides was integral to our decision to relocate Concur's headquarters from Redmond to downtown Bellevue in May 2013... As Concur grows, we strongly believe that increased transit options will help us attract and retain the best talent.

Bus and rail service to Bellevue is not only about getting to work - it's about livability, quality of life and living smart. All three values are necessary for our company to thrive."

SANDY BUMSTEAD, DIRECTOR OF FACILITIES, CONCUR TECHNOLOGIES

"Transit service offers people with special needs access to vital human services, health care, educational opportunities, employment, and a wide range of other activities that in many cases they would not be able to access without transit. Transit therefore plays an important role in reducing social and economic inequalities by enhancing mobility for people, regardless of age, race, income or disability. In particular, it helps to bridge the mobility divide currently existing for many low-income families, people with disabilities, or older adults who lack access to a vehicle."

LAUREN THOMAS, INTERIM CEO, HOPELINK

TMP Forum and Workshops

The three workshops held in support of the Transit Master Plan included the TMP Forum in September 2012, the Transit Network Design Workshop in January 2013, and the Capital and Policy Workshop in September 2013. Each of these provided guidance that helped inform the development of the service and capital visions.

TMP Forum

The TMP Forum provided an opportunity for representatives from the Transportation, Planning, Human Services, and Arts Commissions, the Parks and Community Services Board, and the Bellevue Network on Aging to engage in a discussion with City Councilmembers Kevin Wallace and (then-mayor) Conrad Lee and City staff about trends and policies related to transit in Bellevue, and how the Council-approved Project Principles (see PAGE ##) should be considered in the context of some of the fundamental tradeoffs regarding transit service allocation. The following four main themes summarize that discussion, and the quotes (below right) provide insight into participants' recognition of the need to make strategic investments in transit to grow ridership:

1. Transit is an essential component of the City's mobility strategy and an increasingly important tool for addressing Bellevue's anticipated growth in travel demand.
2. More can be done to improve transit service for people who depend on transit due to age or disability, in areas of lower density, and at non-peak hours.
3. Current sources of funding won't cover everything that needs to be done; as such, the near-term focus needs to be on maximizing ridership.
4. We need to make strategic investments to support future development and growth in ridership.

Figure 31 Then-Mayor Conrad Lee discusses the role of transit in Bellevue with Planning Commissioners Tebelius and Carlson, Human Services Commissioner Yantis, Parks & Community Services Boardmember Hollebeke, and City staff at the TMP Forum.

Figure 32 TMP Forum participants including Councilmember Lynne Robinson (then of the Parks & Community Services Board) and Commission-members Fateeva (Arts), Laing (Planning), McEachran (Human Services), and Bishop (Transportation).

Figure 33 Transportation Commission member Tom Tanaka discusses potential speed and reliability improvements at intersections with Commission-members Beighle (Human Services), Sheffels (Planning), and Heath (Parks & Community Services).

Figure 35 Participants contemplate how to allocate the transit service resources they were provided.

Figure 36 'Rules' of the network design exercise.

Figure 37 Consultant Jarrett Walker highlights how the networks designed by Groups 5 and 6 demonstrate the trade-off between providing a grid of frequent service and widespread coverage with infrequent service, respectively.

Transit Network Design Workshop

The Transit Network Design Workshop was held early in the Service Element planning process to more clearly define priorities related to the location and frequency of transit service in and around Bellevue. Board and commission members and other stakeholders were asked to brainstorm what corridors should be prioritized in the 2030 transit network and what service frequency should be allocated to each based on the projected growth in population, employment, and ridership, and the values previously expressed by the community, Council, and TMP Forum participants. Keypad polling was used to record participants' preferences among competing priorities, from which the following themes can be drawn:

1. Pursue robust all-day service with supplementary peak service. This approach was favored by most, though a notable minority preferred emphasis of peak-only commuter services instead.
2. Encourage transferring to foster a more frequent and more connective network. More than half favored this approach; nearly a third preferred more direct service at the expense of frequency.
3. Prioritize abundant service rather than investing in service that caters to higher-end markets.
4. Consider homes and jobs within one-quarter to one-half mile of transit to be served. About half of participants considered this distance an acceptable maximum; most others consider one quarter-mile as the acceptable maximum.
5. It is acceptable to not provide service to between 25 and 35 percent of Bellevue's population if necessary to provide a more useful, better-performing network for all users. About one-fifth considered 15 percent to be the maximum acceptable unserved share of the population; less than one-tenth of respondents considered service coverage of 95 percent or more necessary.

Capital and Policy Workshop

Following the completion of the *Transit Service Vision Report*, the Capital and Policy Workshop was held to consider potential policies and infrastructure investments that would improve transit travel time and reliability along major transit corridors identified in the proposed 2030 network. Workshop participants discussed the appropriate degree to which transit should be given priority over other modes—if at all—and in which situations. This was considered both in terms of the language used in City policies and in relation to transit priority treatments used along particular corridors. The following themes summarize the discussion and keypad polling exercise.

1. Bellevue faces difficult choices about the use of its limited street right-of-way.
2. It is neither possible nor desirable to build enough roadway improvements to keep pace with ever accelerating demand for travel in single-occupant vehicles.
3. In principle, high-ridership frequent transit deserves a higher priority than low-occupant private vehicles in access to limited road capacity.
4. Manage arterial travel lanes to maximize the throughput capacity for people rather than vehicles.
5. Transforming high-volume arterials into transit-supportive corridors requires careful and coordinated planning.
6. Package transit speed and reliability improvements with supportive land use policies, pedestrian and bicycle amenities, stop/station design, and transportation demand management strategies.
7. Make transit the logical choice for a wide range of people and situations by ensuring reliable operations.
8. Consider pursuing bold investments in transit priority on some high-demand corridors by 2030.

Figure 38 Then-Mayor Conrad Lee opens the Capital and Policy workshop by emphasizing the important role of transit in Bellevue's future.

Figure 39 Participants cast votes using keypad polling devices. City officials, staff, and project consultants did not cast votes during audience polling exercises.

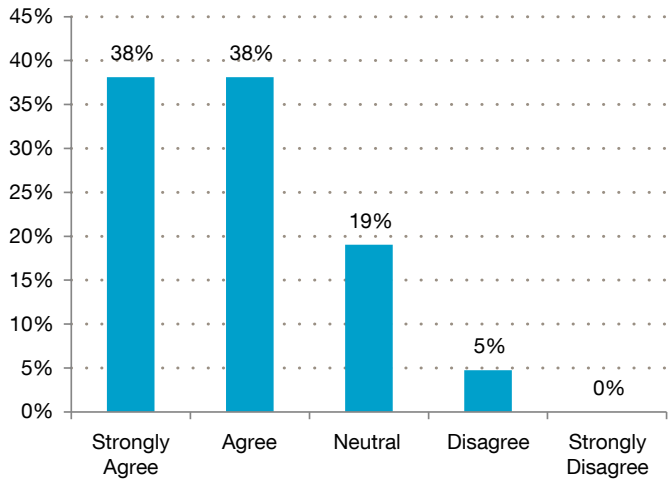


Figure 40 In principle, high-ridership frequent transit deserves a higher priority than low-occupant private vehicles in access to limited road capacity.

Draft

EXISTING AND FUTURE CONDITIONS

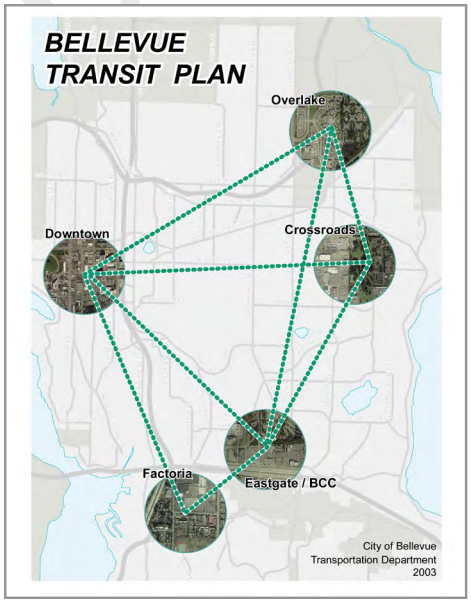


Figure 41 The 2003 *Transit Plan* provided recommendations about how transit service should operate in Bellevue and what capital investments and policy strategies could be pursued to support those transit services locally.

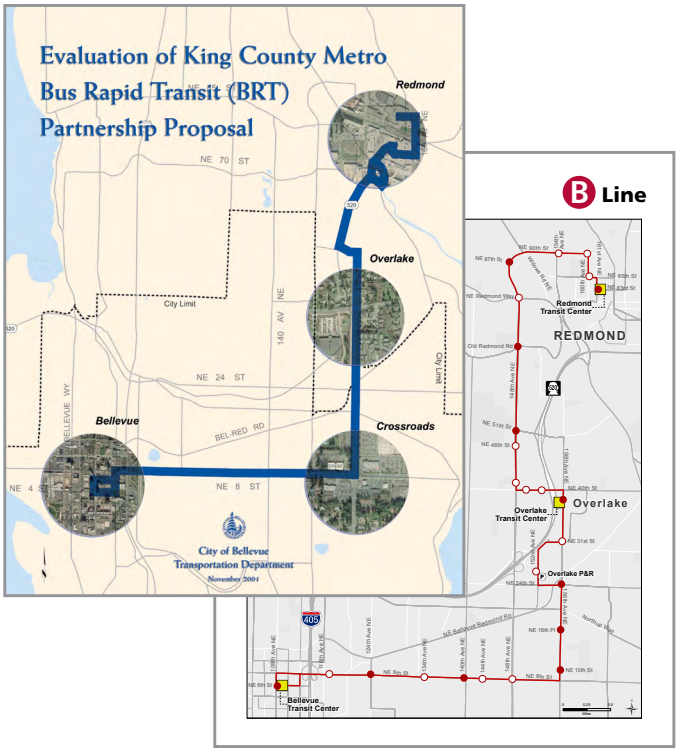


Figure 42 This 2001 BRT evaluation report provides an example of how long-term service planning established a vision for future implementation. The RapidRide B Line ultimately began service in Fall 2011.

BACKGROUND

In response to community feedback, the Transit Master Plan examines opportunities and obstacles to improving transit in Bellevue. This section summarizes recent changes and current and projected future conditions relating to transit in Bellevue to inform the identification of future service and capital improvements.[1]

Since the adoption of the 2003 *Transit Plan*, hundreds of millions of dollars in HOV access ramps, transit centers, park-and-ride lots, and speed and reliability projects have been completed in Bellevue in support of transit operations. Figure 44 reflects the array of capital improvements implemented since 2003 in coordination with King County Metro, Sound Transit, and WSDOT. Services operating in Bellevue have also been restructured on several occasions since 2003, with the most significant recent revision occurring in Fall 2011. Among other notable changes, that network restructuring resulted in the introduction of the RapidRide B Line, a route whose concept was first defined by a planning study conducted in 2001 (see Figure 42), providing an example of how long-range planning programs like the TMP ultimately translate into tangible improvements.

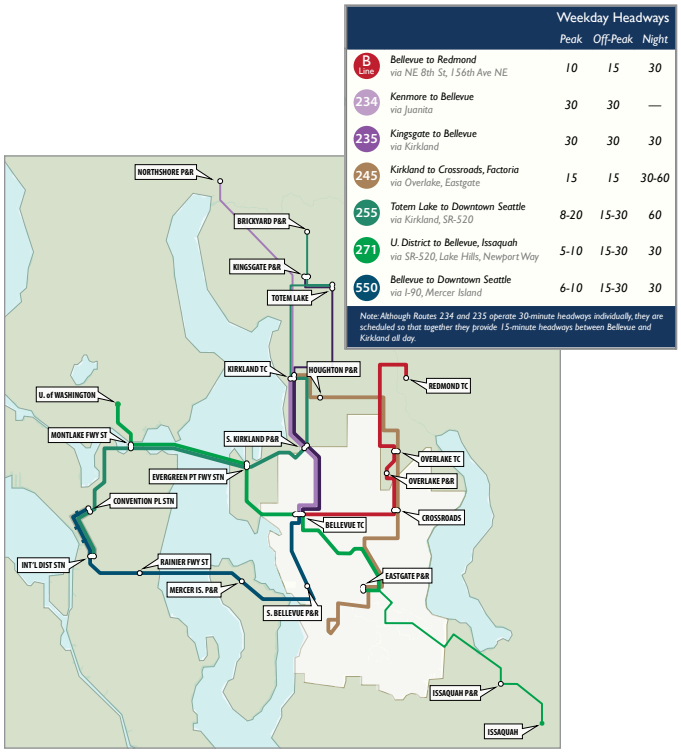
In addition to these transit improvements, much has also changed in Bellevue in the decade since that plan's adoption: the city has grown significantly in terms of both population and employment, Downtown has developed into the primary regional urban center on the Eastside and competes as much with Seattle as it does with its neighboring suburbs,

1 Refer to the *Existing and Future Conditions Report* for more information about the use of geographic information systems, route performance data, market research, and travel demand model data informing this work.

Draft

planning studies have established new visions for activity centers including Eastgate and Bel-Red, and East Link will connect Bellevue to Sound Transit's regional light rail network by 2023.

Meanwhile, King County Metro, the primary transit operator in Bellevue, has confronted funding shortfalls twice since the TMP process began in 2012, creating uncertainty about what level of resources will be available for transit in the future. It is in this context of growth, both realized and projected, and future changes both planned and unknown that the Transit Master Plan establishes a vision for how bus services will operate in Bellevue through 2030, how these will be coordinated with East Link light rail, and how the City can direct infrastructure investments to maximize the usefulness and attractiveness of those services to the community and thereby its ridership potential.



		Weekday Headways		
		Peak	Off-Peak	Night
B Line	Bellevue to Redmond via NE 8th St, 156th Ave NE	10	15	30
234	Kenmore to Bellevue via Juanita	30	30	—
235	Kingsgate to Bellevue via Kirkland	30	30	30
245	Kirkland to Crossroads, Factoria via Overlake, Eastgate	15	15	30-60
255	Totem Lake to Downtown Seattle via Kirkland, SR-520	8-20	15-30	60
271	U. District to Bellevue, Issaquah via SR-520, Lake Hills, Newport Way	5-10	15-30	30
550	Bellevue to Downtown Seattle via I-90, Mercer Island	6-10	15-30	30

Note: Although Routes 234 and 235 operate 30-minute headways individually, they are scheduled so that together they provide 15-minute headways between Bellevue and Kirkland all day.

Figure 43 Spring 2012 Frequent Transit Network, reflecting all-day routes that operate headways of 15 minutes or better during the peak and 30 minutes or better off-peak.

Figure 44 An assortment of major transit capital projects completed since the adoption of Bellevue's 2003 Transit Plan.

Bellevue Transit Center (2003) - $16 million

Downtown Bellevue HOV Access (2005) - $144 million

RapidRide B Line (2011) - $10 million

Eastgate Park-and-Ride (2004) - $27 million

Eastgate Direct Access Ramp (2006) - $19 million

I-90 Two-Way Transit & HOV (2009–2016) - $188 million

Draft

EXISTING TRANSIT LANDSCAPE (2003–2013)

Figure 45 The RapidRide B Line provides frequent, all-day service between Downtown Bellevue and Redmond via Crossroads and Overlake, serving about 8,400 daily ons/offs in Bellevue in Spring 2013.

Figure 46 Sound Transit Express Route 550 is the primary transit connection between Downtown Bellevue and Seattle. Service operates all day along much of the future East Link light rail corridor.

Figure 47 Metro Route 245 is an all-day route that provides frequent service from Kirkland to Overlake, Crossroads, Bellevue College, Eastgate, and Factoria, serving about 5,000 daily ons/offs in Bellevue in Spring 2013.

The evaluation of existing conditions involved extensive use of geographic information systems, route performance data, market research, and travel demand model data to provide:

- An overview of the current bus network structure, services provided in terms of miles and hours, and ridership;
- An assessment of transit service availability and competitiveness in terms of service area coverage, frequency of service by day-of-week and time period, and travel times comparing buses and automobiles between major activity and neighborhood centers;
- An appraisal of route performance as measured by efficiency, effectiveness, and reliability;
- An understanding of demographic characteristics influencing transit performance;
- An understanding of public opinion regarding transit service in Bellevue.[2]

Existing Services

As of the Spring 2012 service period, which serves as the baseline for the purposes of the Transit Master Plan, King County Metro and Sound Transit jointly operate 42 bus routes with at least one stop in Bellevue.[3,4] These can most generally be classified as one of two types of service: all-day or peak-only.[5] Seventeen routes comprise Bellevue's all-day service network, which provide connections from morning through evening between areas of concentrated activity via highways, major arterials,

2 For more information about these topics, refer to the *Existing and Future Conditions Report*, *Transit Network Profile Report*, and *Transit Improvement Survey Report*.
3 Sound Transit contracts with King County Metro, Community Transit, and Pierce Transit to operate regional express buses in Bellevue.
4 These do not include the routes that Metro operates for the Bellevue School District, which operate only one trip each in the AM and PM peak periods.
5 Route 280 is the lone exception, which provides night owl service.

Draft

and neighborhood streets, serving a variety of travel needs and trip purposes (see Figure 50). The peak-only service network provides faster travel times and accommodates very high demand for travel to and from major employment centers and park-and-ride lots during morning (5–9 AM) and afternoon (3–6 PM) commuting periods (see Figure 51).

All routes in the all-day service network do not provide the same level of service. As shown in Table 2, the two primary qualities differentiating all-day services are frequency and span. The RapidRide B Line is the only route in Bellevue currently classified by Metro as "very frequent," operating 15-minute headways or better all day. Six additional routes operate 30-minute headways or better all day with 15-minute frequency during peak hours, currently considered "frequent" by Metro. All other all-day routes were classified as "local" services in Spring 2012.[6] Twenty-four routes are weekday peak-only services, accounting for about 20 percent of the approximately 728,000 annual platform hours operated in Bellevue in 2012.[7]

Research suggests that 15-minute service is considered a significant threshold to making transit competitive with driving, particularly for commuters; less frequent services are generally considered to be unattractive to those with alternative means of travel available. Access to frequent service in Bellevue is currently most widespread during the peak periods. On weekdays during the AM peak (5–9 AM), 37 percent of Bellevue's population has access to 15-minute service within a quarter-mile radius of a bus stop. Only 29 percent of Bellevue's population

Figure 48 Metro Route 271 provides frequent all-day service between the University of Washington and Issaquah via BTC, Bellevue College, and Eastgate, serving about 6,700 daily ons/offs in Bellevue in Spring 2013.

Figure 49 Metro Route 235 provides all-day service between Downtown Bellevue and the Kingsgate Park-and-Ride via the South Kirkland Park-and-Ride and Downtown Kirkland. Although Routes 234 and 235 operate 30-minute headways individually, they are scheduled so that together they provide 15-minute headways between the downtowns of Bellevue and Kirkland.

Table 2 Typical frequency, span, and days of operation by service family, as currently defined by Metro.

2012 Service Family		Frequency (Headway in min) Peak	Off-Peak	Night	Span	Days of Service
All-Day	Very Frequent	≤15	≤15	≤30	16-20 hrs	7 days
	Frequent	≤15	30	30	16-20 hrs	7 days
	Local	30	30-60	—*	12-16 hrs	5-7 days
	Hourly	≥60	≥60	—	8-12 hrs	5 days
Peak-Only		8 trips/day minimum	—	—	Peaks	5 days

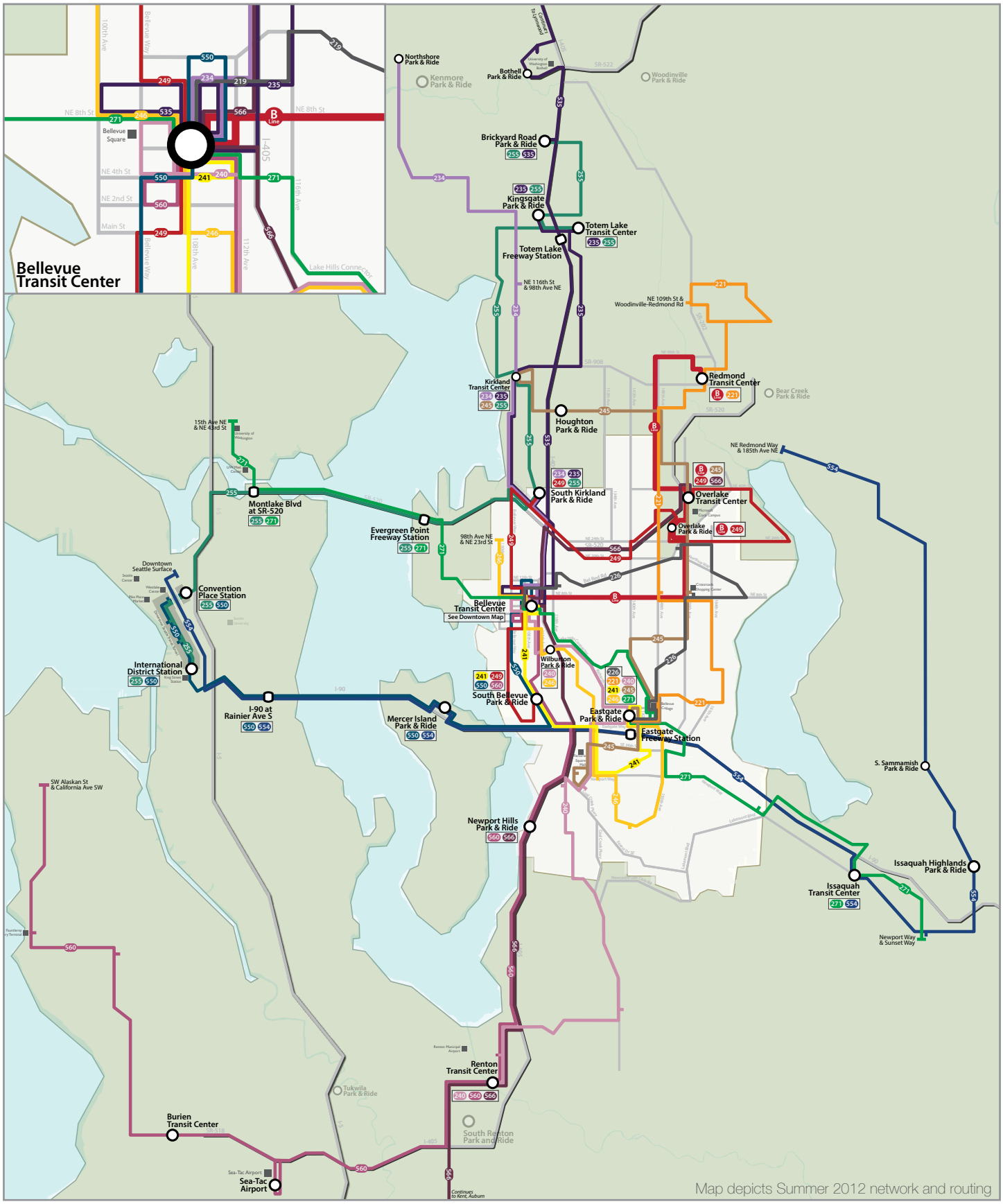
**Night service on local corridors varies based on ridership and connections.*

6 Over the course of the two year TMP process, revisions were made to several routes following the establishment of the service planning baseline. For example, Route 246 is now classified as "hourly," operating 60-minute headways all-day; Route 249 now operates 60-minute headways off-peak; Route 216 now serves Bellevue in the AM peak only; Route 566 has been divided into two separate routes—566 (all-day) and 567 (peak-only)—and only the latter provides service to Bellevue.

7 Peak-Only Route 219 was deleted in the Summer 2012 service change.

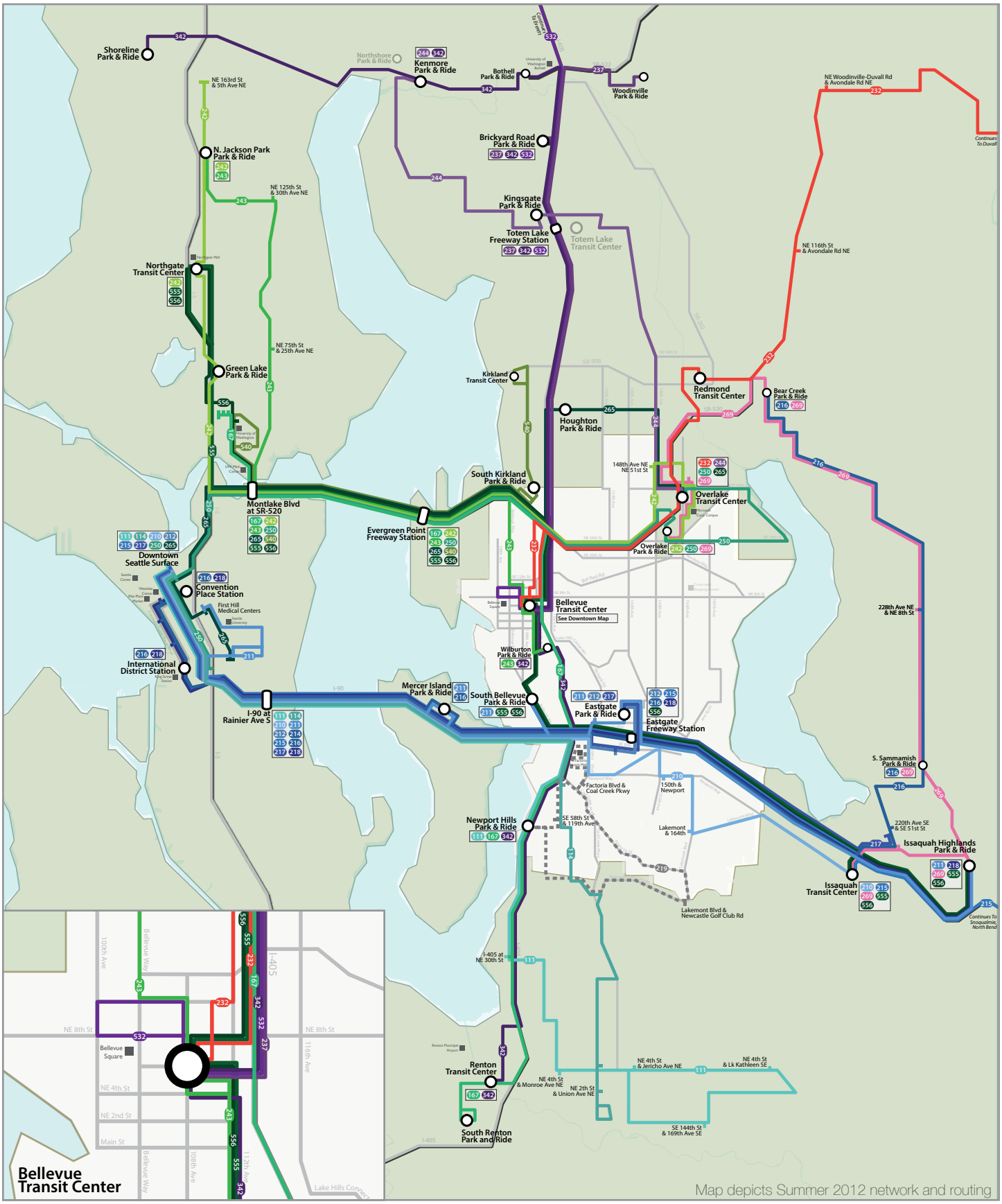
Draft

Figure 50 All-day service network, Spring 2012.
Includes the RapidRide B Line and Routes 221, 226, 234, 235, 240, 241, 245, 246, 249, 255, 271, 535, 550, 554, 560, and 566.



Draft

Figure 51 Peak-only service network, Spring 2012.
Includes Routes 111, 114, 167, 210, 211, 212, 215, 216, 217, 218, 219, 232, 237, 242, 243, 244, 250, 265, 269, 342, 532, 540, 555, 556.



Draft

enjoys such access mid-day (9 AM–3 PM), and the percentage declines further during evening hours (6–10 PM) to only 13 percent—those areas within one quarter-mile of RapidRide B Line stops. It should be noted that a quarter-mile of straight-line distance likely over-estimates accessibility, as the actual walking distance may be much longer than a quarter-mile.

Service Performance

In Fall 2013, there were approximately 53,640 average weekday boardings and alightings (ons/offs) in the city of Bellevue. Between 2003 and 2013, transit use in Bellevue grew by 144 percent, or an additional 31,700 daily ons/offs.[8] The most significant growth during this period occurred in Downtown Bellevue (134% increase), Eastgate (348% increase), and Crossroads (118% increase).

While ridership on most Bellevue routes has grown since 2003, certain routes had much larger gains than others. High ridership corridors are typically those with frequent service that have strong anchors at both route ends—namely areas with higher population and/or employment density. Route 550, Route 245, and the RapidRide B Line are all examples of such corridors. These routes each had frequency increases to accommodate growing demand, and they show clearly that connecting the right population and employment markets with high quality, frequent transit service leads to improved ridership. By contrast, usage of coverage routes (e.g. Route 246) that broaden the geographical reach of transit with circuitous neighborhood routing have not increased as consistently as high frequency corridors. Balancing the needs of lower density areas with continued ridership growth in high density and growing corridors will be an on-going challenge.

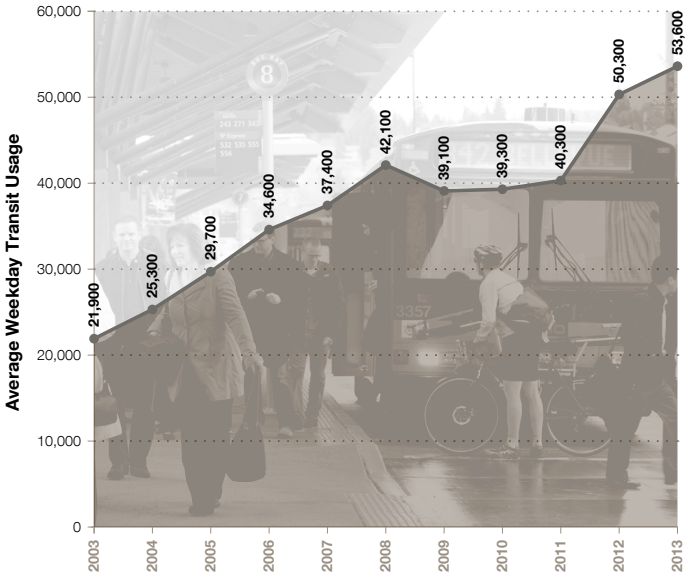


Figure 52 Daily boardings and alightings (ons/offs) at bus stops in Bellevue, Fall 2003–2013.

8 Ridership figures prior to Spring 2013 did not include data for routes operated by Community Transit (532, 535) or Pierce Transit (566), which account for about 5,350 daily ons/offs in Fall 2013. If these routes are not considered, daily ons/offs have increased by 120 percent since Fall 2003.

Draft

FUTURE TRANSIT LANDSCAPE (2014–2030)

Consistent with direction provided by City Council, the Transit Master Plan aims to "determine where and how transit investments can deliver the greatest degree of mobility and access possible for all populations."[9] To that end, the Transit Master Plan looks to the future and strives to be compatible with Bellevue's land use and transportation plans and the challenges and opportunities of changing demographics, land use characteristics, and travel patterns. As with the assessment of existing conditions, consideration of future conditions included the use of geographic information systems and travel demand modeling to provide an evaluation of changing demographics, land use characteristics, and travel patterns that will affect future transit performance.

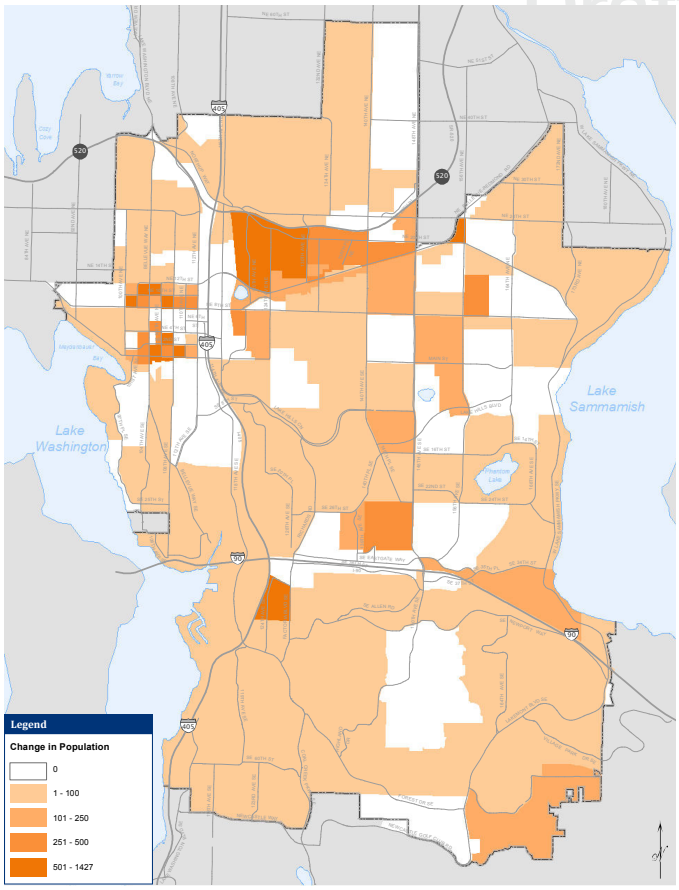


Figure 53 Population growth in Bellevue, 2010–2030.

Population & Employment Growth

Between 2010 and 2030, Bellevue is expected to increase in population by over 28,000 people. Downtown Bellevue is expected to double in size, reaching 19,000 residents by 2030 and comprising about 45 percent of the city's projected population growth over the next twenty years (see Figure 53). Bel-Red is expected to accommodate about 7,500 additional residents—almost another third of the projected growth—and other mixed use areas will account for about 16 percent. The number of jobs in Bellevue is expected to increase by over 54,000 between 2010 and 2030 (see Figure 54). Downtown Bellevue is projected to capture over half of these additional jobs, Bel-Red about 18 percent, Eastgate almost 14 percent, and the SR-520 corridor nearly 5 percent. Other commercial and industrial lands in the city are expected to capture the remaining 12 percent of projected growth in employment.

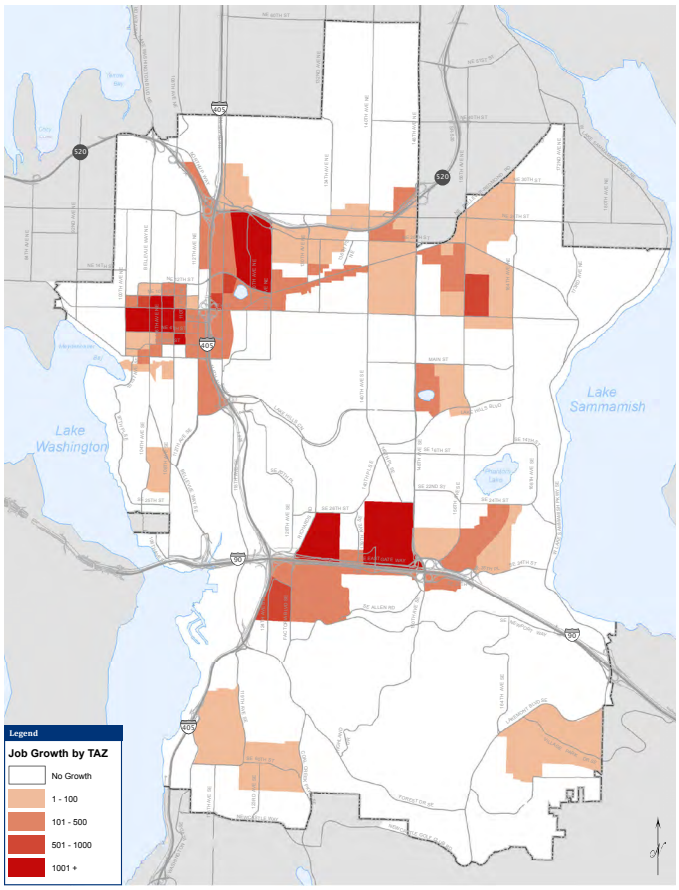


Figure 54 Employment growth in Bellevue, 2010–2030.

9 Refer to the Project Principles in Appendix 2.

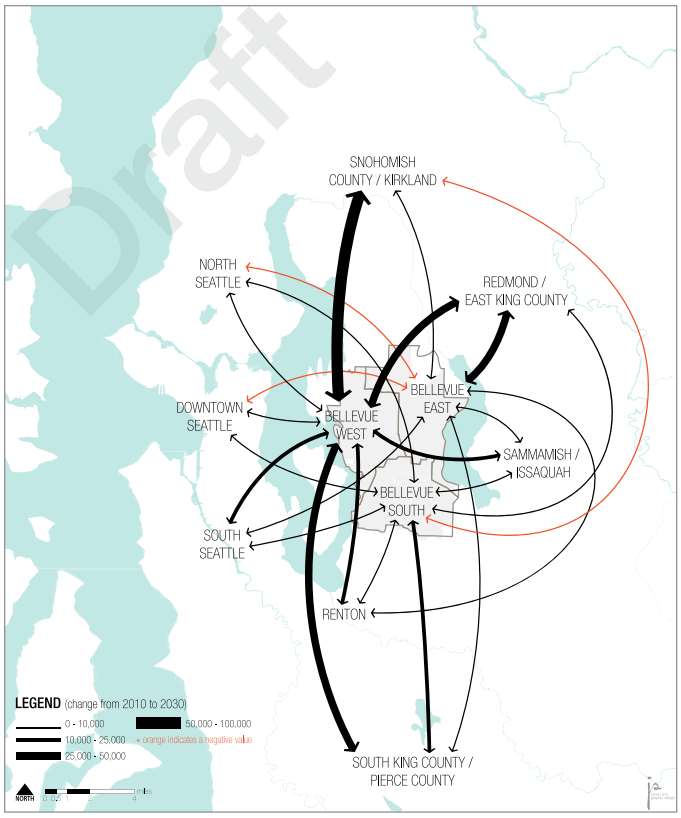


Figure 55 Change in regional travel demand, 2010–2030.

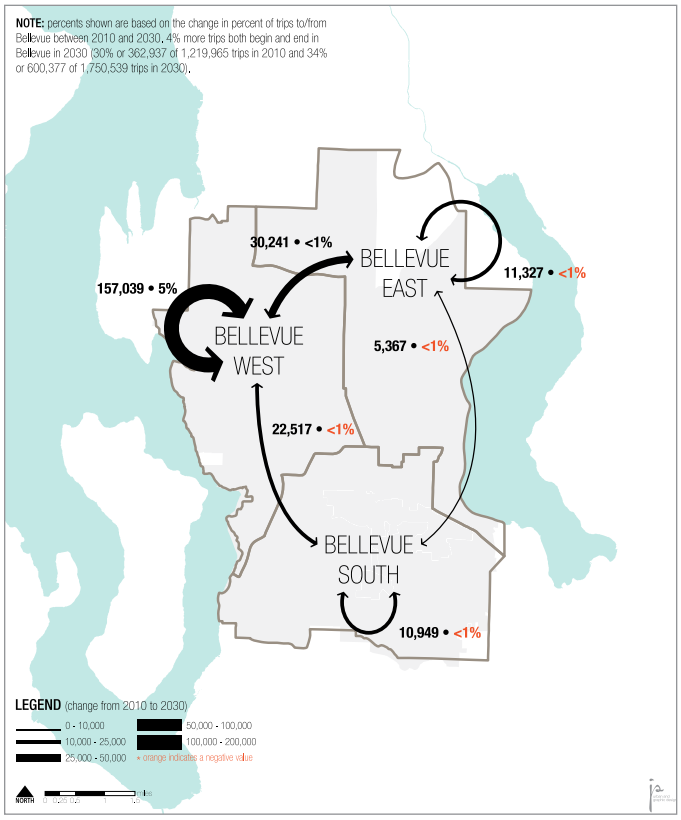


Figure 56 Change in local travel demand, 2010–2030.

Travel Demand Growth

The City's Bellevue-Kirkland-Redmond (BKR) travel demand model was used to examine existing (2010) and future (2030) travel patterns. According to BKR model projections, the total number of daily person trips to/from or internal to Bellevue will increase from 1,220,000 in 2010 to 1,751,000 in 2030, a 43 percent increase. Approximately 43 percent of the projected increase in daily trips is regional travel to/from the Bellevue West area, which includes Downtown—the largest, production/attraction market for trips to/from Bellevue.[10]

The number of trips beginning or ending outside of Bellevue is projected to increase by over 260,000 trips. The largest increases are from the I-405 North Corridor, the SR-520 corridor to Redmond, and the I-405 South/SR-167 corridor markets (see Figure 55). Although the Seattle market is smaller than the close-in suburban markets in terms of total trips, due to the more transit supportive land uses in Seattle, the transit trip market between Bellevue and Seattle remains larger than any other regional transit market.

About 237,000 new daily trips are projected to occur entirely within Bellevue between 2010 and 2030 (see Figure 56). The Bellevue West area alone will serve an estimated 157,000 new trips daily—most of them non-work trips (144,000)—with the number of internal trips projected to more than double between 2010 and 2030. This reflects the growing importance of Downtown Bellevue as not just a job center, but also as both a thriving neighborhood and a regional destination. The non-work trip market, particularly in the densely populated and retail/entertainment-rich part of the Bellevue West area, represents the single-largest untapped market for transit in Bellevue.

10 Refer to the *Existing and Future Conditions Report* for additional flow maps and forecast data.

Future Roadway Investment

Although transit infrastructure investments are primarily the focus of the Capital Element, it should be noted that existing plans are in place and conceptual design work is already funded for several roadway projects that will benefit bus transit operations in Bellevue.[11] Infrastructure investments that can improve the average speed of coaches on city streets will improve the travel time, schedule reliability, and cost efficiency of transit services, potentially improving its competitiveness with other modes and contributing to increased ridership. The service vision assumes that some of these projects will be completed in the coming years and will contribute to the successful implementation of the proposed mid- and long-term networks. More fundamentally, the increase in demand for transportation associated with the projected growth in population and employment could outpace available infrastructure capacity, so these projects help increase the overall performance of Bellevue's transportation system, not just that of transit operations.

Some of the investments detailed in the City's 2013–2024 Transportation Facilities Plan (TFP) include extensions of NE 4th St and NE 6th St, creation of a gridded street network in Bel-Red, and widening 120th Ave NE. These will improve mobility between Downtown Bellevue, Bel-Red, and Overlake, balancing circulation throughout the existing downtown grid by drawing traffic away from NE 8th St and other roadways accessing or crossing I-405. Other projects under consideration include redesigning Snoqualmie River Road adjacent to the west side of Bellevue College to accommodate high volumes of bus traffic and eliminate the existing service deviation through the campus and installing an HOV lane on Bellevue Way SE to I-90 to improve traffic flow.

11 Refer to Appendix A of the *Existing and Future Conditions Report* for the complete project list from the Transportation Facilities Plan (TFP).

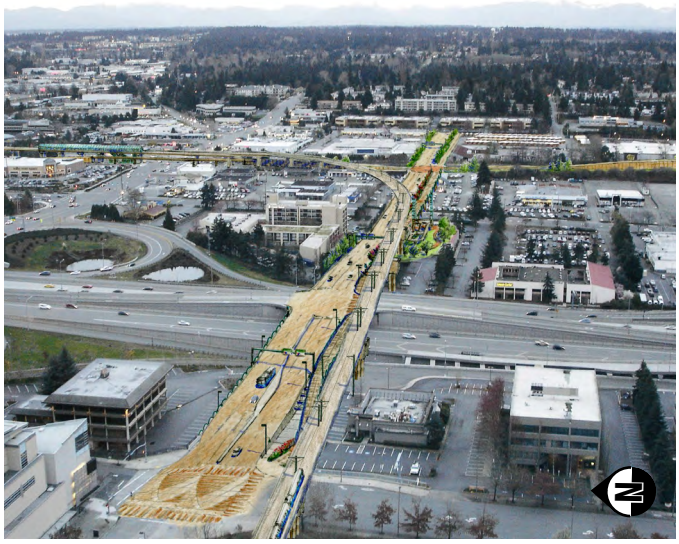


Figure 57 Artist rendering of East Link light rail integrated with the NE 6th St HOV Extension (TFP-211, CIP R-162), identified as Running Way Project L19 in the Transit Master Plan.

Figure 58 Improvements to Snoqualmie River Rd would facilitate the restructuring of service between Bellevue College and the Eastgate Park-and-Ride. This existing project (TFP-252) has been refined by the Transit Master Plan, with the above conceptual renderings reflecting how planning for the project has advanced.

Draft

Figure 59 East Link will give transit users a fast, frequent, reliable connection between the Eastside's biggest population and employment centers and Downtown Seattle.

Figure 60 Bellevue will be served by six stations, including South Bellevue Station, three stations in and around Downtown, and two stations in Bel-Red.

East Link Light Rail

Approved by Puget Sound-area voters in 2008, Sound Transit's East Link light rail will run between International District Station in Downtown Seattle and Overlake via I-90, Mercer Island, South Bellevue, Downtown Bellevue, and the Bel-Red corridor. Service is projected to open in 2023 and will serve six stations in Bellevue. Light rail transit (LRT) is expected to address the most significant transit ridership market for Bellevue: in 2012, four of the top ten highest-ridership bus routes (550, 255, 554, and 212) operating in Bellevue had a terminus in Downtown Seattle. By providing the cross-lake market with high capacity transit services, implementation of East Link represents a transformational opportunity to reimagine the current bus network in Bellevue.

Convenient transfers from light rail stations to the bus network can effectively extend the reach of the regional light rail transit system. Effective intermodal integration is required at East Link stations to ensure reliable connections and avoid unnecessary transfer delay. A primary emphasis of the future bus network will therefore be to provide connections to East Link light rail service. This will require the reduction or elimination of routes that duplicate services provided by East Link and the shifting of resources to routes that strengthen bus connectivity with LRT stations.

The BKR travel demand model estimates that 136,000 average weekday boardings and alightings will take place on transit in Bellevue in 2030.[12] Of these, an estimated 20 percent will take place at the six LRT stations in Bellevue. The majority of transit usage in 2030—nearly 80 percent of weekday boardings and alightings—is projected to take place on Bellevue's bus network. This represents a 133 percent increase over Spring 2012 bus usage in Bellevue. By 2030,

12 Calculated early in the TMP process, these figures are based on the transit routing and headway assumptions found in the 2010 East Link Bus/Rail Integration Plan. They have not been updated to reflect the 2030 networks in the *Transit Service Vision Report*.

approximately 20 percent of light rail patronage in Bellevue is expected to come from bus transfers.

In the *Transit Service Vision Report*, the 2030 scenarios all presume the opening of East Link light rail to its planned terminus at Overlake Transit Center. Consistent with direction from Sound Transit, the Transit Master Plan assumes that East Link will operate frequencies of every 8 minutes during the peak, every 10 minutes during the day, and every 15 minutes in the evening. Additionally, it is assumed that North Link to Lynnwood will be complete by 2030. Trains from East Link merge with those from the existing Central Link to run together through the Downtown Seattle Transit Tunnel. In addition, it is assumed that all of these trains continue north at least to Northgate. This implies extreme frequency along the core Seattle corridor extending from the International District to Northgate, specifically frequencies of every 4 minutes during the peak, every 5 minutes all day, and every 7.5 minutes in the evening.

That assumption has important consequences for the Eastside, especially for SR-520 bridge services. Frequencies at the University of Washington Station (open in 2016) will be so high that it will be easy to connect to Link to complete trips to/from many core Seattle destinations, including Downtown, the University District, Ravenna, and Northgate. As a result, fewer SR-520 services need to continue into Downtown Seattle, especially in lower-resource scenarios. While Link may not be faster to Downtown Seattle than a direct SR-520 bus, other considerations will have to be weighed, such as the limitations of street capacity for buses in Downtown Seattle. For these reasons, it is generally assumed that while SR-520 would continue to have peak-period services to Downtown Seattle, the all-day pattern would focus more on frequent cross-lake services to the University of Washington Station to take advantage of the extremely frequent light rail service available there.

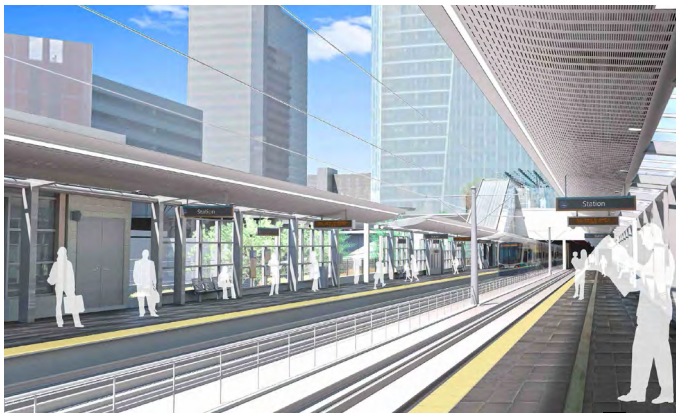


Figure 61 Bird's eye (top) and platform (bottom) views reflecting the 60% design of the station in Downtown Bellevue. The Bellevue Transit Center, where bus services will continue to operate, is immediately across 110th Ave NE to the north.

Figure 62 The 60% design of the South Bellevue Station includes designated space for bus layover and on-site bus stops for routes traveling on Bellevue Way SE.

PHOTO BY Michelle Whitfield

SECTION 2: POLICY ELEMENT

Draft

TMP POLICY FRAMEWORK

Adopted by the Bellevue City Council on July 9, 2012, the Project Principles shown in Figure 64 represent the Council's priorities for directing development of the Transit Master Plan. The City Council envisions a fully integrated and user-friendly network of transit services for Bellevue that supports the city's growth, economic vitality, and livability.

Encouraging long-term ridership growth involves building capacity to meet future demand for transit service by: (i) providing service where there is anticipated to be high ridership, typically where there is some mix of: higher residential or commercial density; major activity centers; and, measures that discourage driving, such as limited parking; (ii) building and supporting pedestrian, bicycle, and park-and-ride facilities that help people access the transit system; (iii) improving the way people make transit connections so they can reach more destinations in less time; (iv) investing in speed and reliability enhancements like transit priority measures and BRT.

Given Metro's focus on creating a more efficient and productive transit system, the Bellevue Transit Master Plan has adopted strategies that align the City's interests and priorities with Metro's Strategic Plan and associated Service Guidelines. In this context, the Transit Master Plan seeks to make better use of the region's limited resources as efficiently and effectively as possible. To enhance transit performance in Bellevue, it will be critical to integrate the provision of increased transit supply with a supportive land use environment and land use mix, improved transit passenger and walking amenities, and transit-supportive infrastructure. These can be thought of as demand factors for transit, and they are closely related to and can mutually reinforce one another.

On the transit supply side, the overall vision is for transit service to increase over time to have a larger portion of Bellevue's population and jobs located

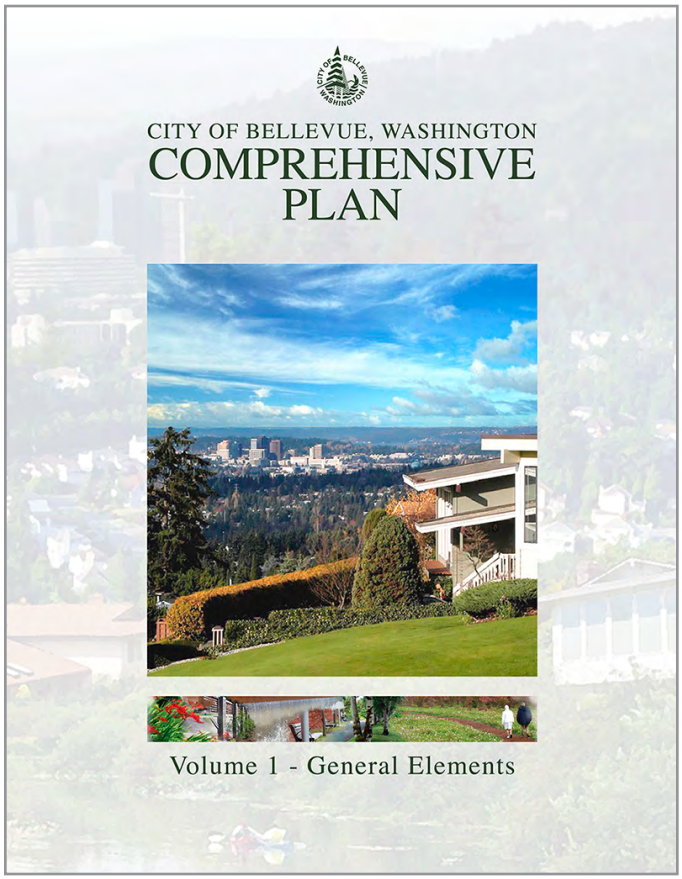


Figure 63 Bellevue's Comprehensive Plan, currently undergoing its decennial update, includes a variety of policies that promote the improvement of the transit services operating in the city. These policies highlight the City's recognition that enabling people to substitute single occupancy vehicle trips for transit trips has the potential to convey multiple public benefits, including increased transportation options, reduced growth of traffic congestion, decreased air, water, and noise pollution, support for climate change emission reduction goals, and stimulation of the local economy.

Draft

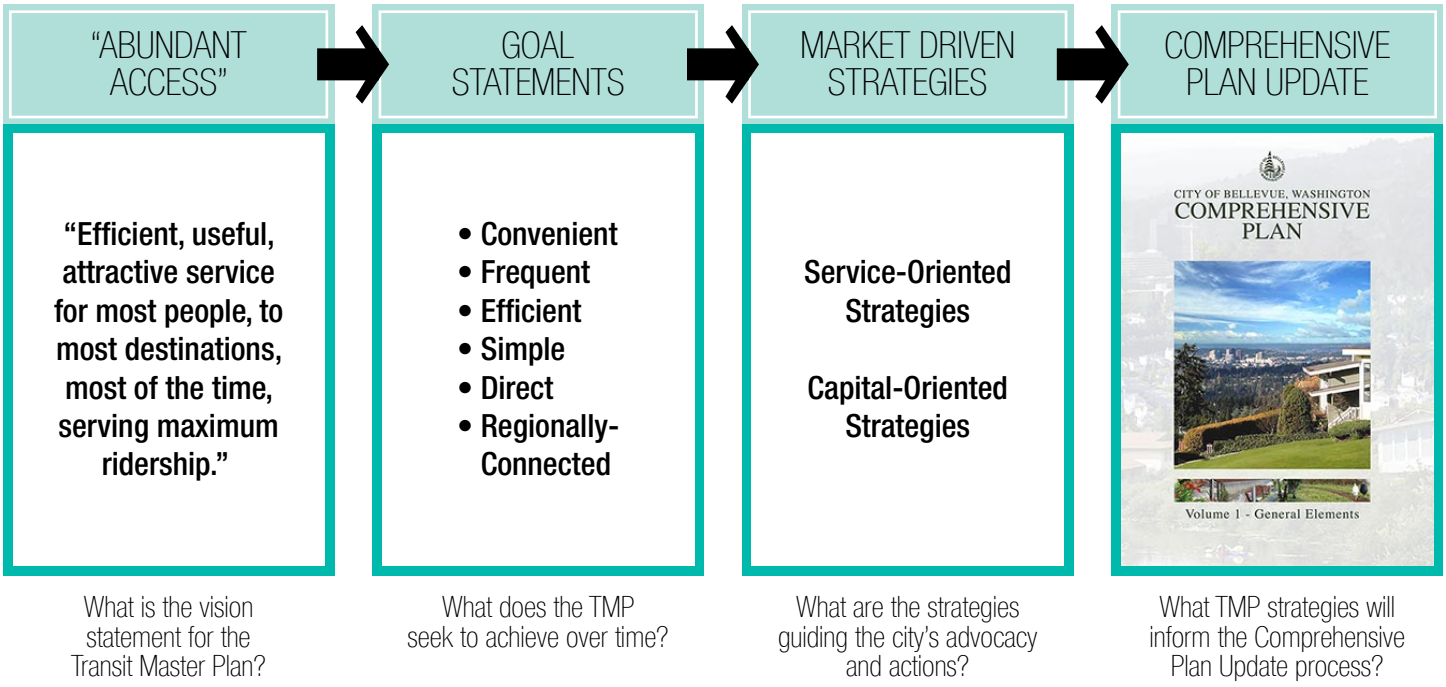
within walking distance of the network, as well as for its frequency and quality of service to improve as demand increases. In short: transit service in Bellevue should be designed to help more people reach more destinations in less time.

The Transit Master Plan vision statement arises from a consideration of competing transit service priorities. It is recognized that by moving toward one goal, the City is moving away from others that have some support, but these choices will lead to a network that provides abundant access and reflect the features of other successful urban transit systems in the United States and around the world. The following policy framework takes a fresh look at the current Comprehensive Plan policies, offering a new template based on extensive input from the community and board and commission members. In addition to shaping the development of the Transit Master Plan, the policies presented here will also help guide the updates being made to transit policies in Bellevue's Comprehensive Plan.

Figure 64 Transit Master Plan Project Principles, approved by the Bellevue City Council, July 9, 2012.

1. **Support planned growth and development in Bellevue with a bold transit vision that encourages long-term ridership growth.**
2. **Engage community stakeholders in setting the priorities for transit delivery.**
3. **Determine where and how transit investments can deliver the greatest degree of mobility and access possible for all populations.**
4. **Incorporate other transit-related efforts (both bus and light rail) underway in Bellevue and within the region.**
5. **Indentity partnership opportunities to further extend transit service and infrastructure.**
6. **Develop measures of effectiveness to evaluate transit investments and to track plan progress.**

Figure 65 This graphic describes the structure of the Policy Element, with the "Abundant Access" vision statement and goals leading to Market-Driven Strategies that inform both the Service and Capital Visions and the Comprehensive Plan Update process.



Draft

Vision Statement

Support planned growth and development with a bold transit vision that provides efficient, useful, attractive service for most people, to most destinations, most of the time, serving maximum ridership.

A number of important themes are embedded in this "Abundant Access" vision statement. First, the idea that the City should ***"support planned growth and development with a bold transit vision"*** emphasizes that Bellevue should plan, design, and build a community that increases transit's appeal as the mode of choice for an increasing number of people who live, work, shop, and play in Bellevue. That transit service should be ***"efficient, useful, attractive"*** suggests it is meant to be useful to people in a wide range of situations, not just people who lack travel options. ***"To most destinations, most of the time"*** means that taking transit is not a niche activity only for commuters; rather, it is part of the overall urban framework and will be used by a broad range of people throughout the city. Finally, ***"serving maximum ridership"*** aligns Bellevue's vision with the focus of King County Metro's Service Guidelines on a transit system that results in high productivity (ridership per unit of cost).

Goal Statements

Bellevue's transit vision statement is supported by six overarching goals that articulate what the Bellevue Transit Master Plan seeks to achieve over time to meet this vision (see Figure 66). The City recognizes that achieving these goals necessitates making a series of choices among competing priorities.[1] After carefully evaluating these trade-offs, the TMP endorses the market driven strategies presented on the following pages as being in the best interest of the community.

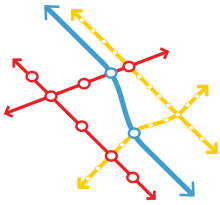
1 Refer to the *Market Driven Strategies Report* for details.

Figure 66 Transit Master Plan goal statements.

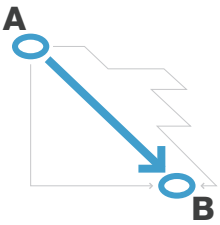
CONVENIENT, making it the logical choice for the largest possible share of trips.

FREQUENT, to minimize waiting times and improve connections.

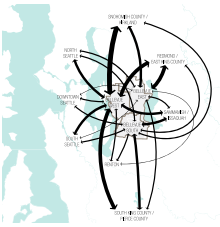
EFFICIENT, in terms of being designed for high ridership and cost-effective operations.



SIMPLE, with the fewest possible discrete lines, so that each can have the best possible frequency, speed, and duration without complicated redundancy.



DIRECT to major activity centers in Bellevue by minimizing the degree to which a route deviates from the shortest path between its start and end points.



REGIONALLY CONNECTED, with a complete network of regional links in all directions, with particular focus on abundant north-south service along I-405.

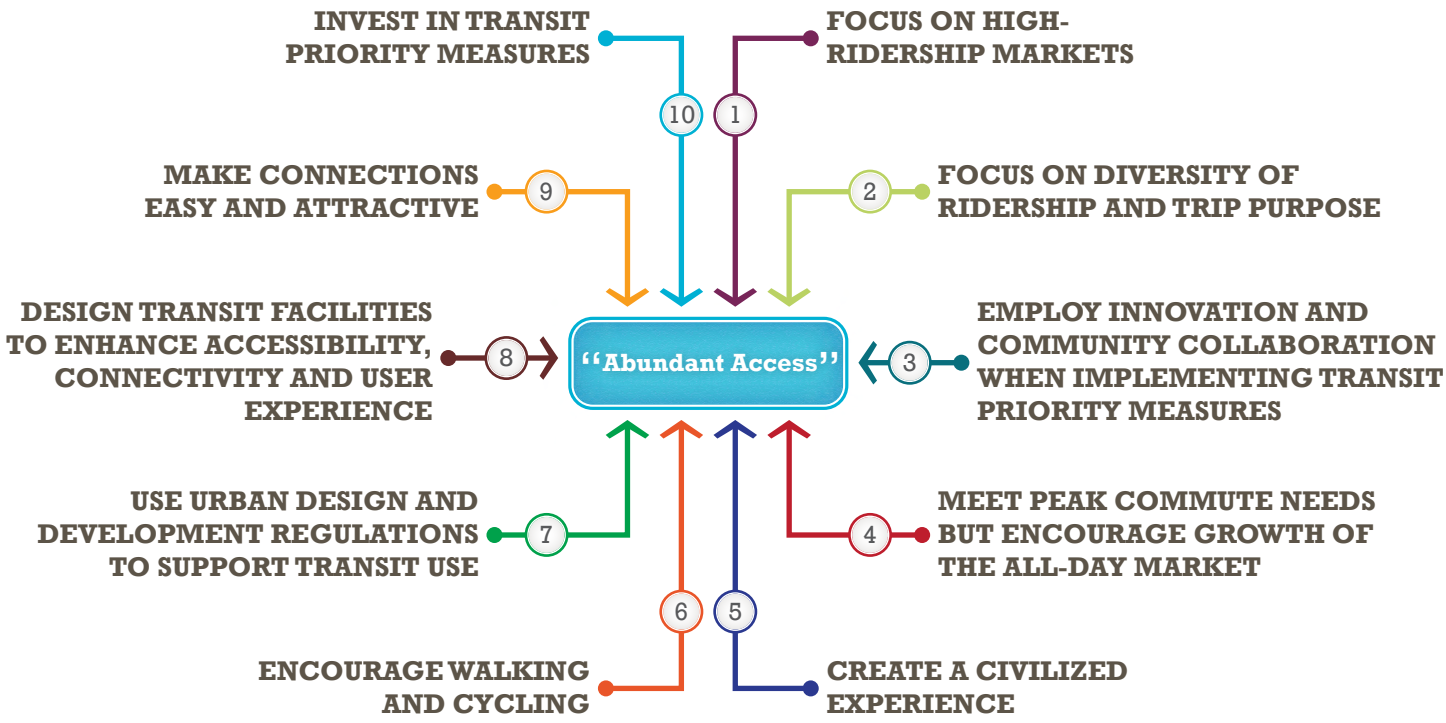
Draft

Transit Strategies

Ten strategies guide the City's actions toward realizing the "Abundant Access" vision statement. These strategies recognize that encouraging long-term ridership growth in Bellevue necessitates transit service enhancements that support existing and emerging travel patterns paired with the City's commitment to a supportive land use environment, pedestrian and bicycle amenities, convenient and attractive service access facilities, and transit speed and reliability infrastructure. The result will be a more productive transit network that benefits both transit users and the transit agencies operating the service.

The desired end state of these market driven strategies is a Frequent Transit Network (FTN) where transit service and capital investments need to be focused to serve the most riders and provide the highest quality of service. The FTN supports Downtown growth, Bel-Red corridor redevelopment, and Bellevue's other activity centers with well-connected bus routes that seamlessly interface with East Link light rail. People traveling along FTN corridors can expect convenient, reliable, easy-to-use services that are frequent enough that they never need to refer to a schedule. The core characteristic of the FTN is that it provides all-day, frequent service, wherein the headway (the time between successive buses) of individual constituent routes is 8 minutes or better in peak hours, 10–12 minutes mid-day, and 15–30 minutes at night.

Figure 67 Ten strategies guide the City's actions toward realizing the "Abundant Access" vision statement.



Draft

1 Transit needs to maximize the return on investment on existing and anticipated public transportation projects by providing transit service where high ridership is anticipated, typically where there is some mix of higher residential or commercial density, major activity centers, and measures that discourage driving, such as limited parking.

Sometimes referred to as effectiveness, productivity is essentially the return-on-investment of a transit service. It is a measure of how much ridership a line attracts relative to the cost of providing the service. Today, two-thirds of transit patronage in Bellevue takes place in Downtown Bellevue, Factoria, Crossroads, and Eastgate—major activity centers for which traffic is managed and concurrency standards are established to help guide land development and transportation improvement decisions. As land use and travel patterns change, so does demand for transit. Looking to the future, the transit network should provide more frequent bus service to support: (1) population and employment growth in the rapidly developing areas of Downtown Bellevue and the Eastgate/I-90 corridor; (2) areas of redevelopment in the Bel-Red corridor that will require the introduction of completely new services; (3) the East Link light rail line that will require feeder bus connectivity to extend the reach of this transformational investment in public transportation. By making sure frequent bus service is directed to these productive activity centers, transit providers maximize the amount of service they can provide given limited funding. Thus, while coverage services should be provided to the extent possible within available resources, when trade-offs are required, places that foster more productive service should be prioritized.

"I favor setting up high-ridership corridors for transit that serve high density areas."

– DALLAS EVANS, PARKS & COMMUNITY SERVICES BOARD

"Some neighborhoods will always be difficult to serve... There is pressure on King County and Sound Transit to reduce unproductive service. To expect that service is going to grow in the short-term is unrealistic. For now we should maintain strong productivity on the transit service we have."

– KRIS LILJEBLAD, ARTS COMMISSION

"There is a geographic coverage issue; that said, it's not realistic to serve low-density single family areas with constant service. Until 2030, we'll just keep getting denser around East Link nodes.... If parking is free, people will use it. If you don't build the parking, and if you have good transit, people will use it."

– HAL FERRIS, BELLEVUE PLANNING COMMISSION

Draft

2 Great transit networks arise from designing services that are useful to the broadest and most diverse possible spectrum of user groups and trip purposes.

For example, Route 240, which links Downtown Bellevue to Renton, is an example of a productive service (i.e., 22 boardings/platform hour and a cost/ boarding of $5.50) catering to workers, students, and other user groups. Given these diverse attributes, it is understandable why twelve more trips were added to this route in Spring 2012. This high performing route stands in stark contrast to Route 925, a former DART shuttle van operation serving Newport Hills, Newcastle, and Factoria. This highly specialized route lacked the appeal for a broad user group with diverse travel patterns. For this reason, in October 2011, Route 925 was eliminated due to poor performance (i.e., 1 boarding/platform hour and a cost/ boarding of $135). Except as required by the Americans with Disabilities Act, we will resist designing specialized services for specialized user groups, and seek instead to design versatile services that many different people find useful for many kinds of trips.

"With 19% of Bellevue residents being older adults and the numbers rapidly increasing in the coming years, the need for available, accessible and easy transit is vital. Transit provides active living such as entertainment, shopping, dining, doctor's appointments, etc. for day, afternoon, and evening travel. Keeping seniors mobile will keep the money in Bellevue!"

– HOUSING & TRANSPORTATION COMMITTEE, BELLEVUE NETWORK ON AGING

"I would like to see more night time service on 234. If it existed I would use it to return home after shopping / dinner / drinks / a movie in Bellevue."

– JOHN, KIRKLAND RESIDENT, CURRENT TRANSIT USER

"Make bus routes more accessible during the late evening. Most Bellevue bus routes end at around 10pm or 11pm. This makes it difficult for people to go to social gatherings in the late evening."

– JUAN, BELLEVUE RESIDENT, CURRENT TRANSIT USER

3 Employ innovation and community collaboration when implementing transit priority measures along Frequent Transit Network corridors.

As the city grows in the future, decisions about how to use the city's streets in the most productive and efficient way possible will be an ongoing challenge. As such, the creation of transit-supportive communities necessitates staying current on changes in transit infrastructure design, speed and reliability tools, and facility types as they evolve. It is important to ensure that transit facilities are designed and built taking into consideration the overall characteristics of the street, the adjoining land use types, and other factors. This approach informs the project development process, from planning through design and finally construction.

"Bus priority of some kind is needed on NE 8th and on 148th where the bus has "pocket" pull-outs at some stops. No one will let the bus back into traffic. It's a big loss of time for busses."

– PAT SHEFFELS, BELLEVUE PLANNING COMMISSION

Draft

4 In addition to moving peak commuters, transit has an important role to play in improving the mobility of people who want to access family and friends, recreation, education, entertainment, health care, and the many activities that contribute to individual and community well-being.

This strategy speaks to the objective of developing a transit network that will appeal to many different people making a wide variety of trips. This means providing service at most hours of the day, in all directions. The existing network in Bellevue is not well designed to capture non-peak trips, as frequencies during the off-peak (with headways typically more than 15 minutes) are often insufficient. Increasing off-peak frequencies on services like Route 245 (that links Kirkland to Factoria via Overlake, Crossroads, Bellevue College, and Eastgate) has the potential to significantly improve the appeal of transit to a wide variety of trip purposes. In Fall 2011 Metro began operating 15-minute headways mid-day on Route 245. Today, this route is among the ten highest ridership routes operating in Bellevue and the most frequent Eastside route that serves neither the Bellevue Transit Center nor Seattle. Indeed, with the majority of its transit patronage occurring in the mid-day, Route 245 is an example of a route with consistent productivity all-day. The transit network should improve the all-day frequencies on routes like 245 that connect many major trip generators, since these destinations can justify better service along the entire corridor. Peak commuters, too, benefit from off-peak service, as today's complex jobs often require off-peak travel, and many people go to work without being sure exactly when they'll be able to come home.

"I wish there were more evening/night buses."
– MICHAEL, BELLEVUE RESIDENT, FORMER TRANSIT USER

"I need to get to work by 5:00 AM and no buses run early enough for me to get to work on time."
– MYRA, BELLEVUE RESIDENT, FORMER TRANSIT USER

"The bus I use is only available during standard commuting times, and it would be better if it was offered later."
– LAURA, REDMOND RESIDENT AND CURRENT TRANSIT USER

"Transit in Bellevue primarily benefits the working commuter, especially those who work in downtown Bellevue…. Bellevue has changing demographics that need non-commute transit: more seniors, young singles that don't own cars, more minorities, more households without kids. These groups need short trip, more convenient, more predictable transit."
– PAT SHEFFELS, BELLEVUE PLANNING COMMISSION

Draft

5 Transit should focus on creating an attractive product at an appropriate price point for the widest possible spectrum of the population.

It is sometimes suggested that transit agencies should develop higher-quality services for high-end markets, possibly with lower crowding, particularly nice seating, and so on. Luxury services at high price points should generally be left to the private sector so that transit can focus on creating an attractive product at an appropriate price point for the widest possible spectrum of the population. The idea that everyone should have a seat during peak hours, for example, may be important for very long commutes but is not practical for shorter trips around Bellevue during busy times.

"Streamline Metro routes such that there are minimal redundancies, like the RapidRide B Line has done. However, when reducing redundancies, please provide more frequent trips for the buses that run the route."

– JASON, BELLEVUE RESIDENT, CURRENT TRANSIT USER

6 As the transit network moves towards attracting more patrons who take transit by choice, it will be increasingly important to factor in the pedestrian and bicycle experience as part of a more holistic ridership strategy so that transit can run more efficiently.

The efficiency of the transit network is compromised when bus routes try to get too close to everyone's home. Integrating pedestrian and bicycle use with transit service is an effective means of attracting new riders by increasing the catchment areas of stations and stops. Since transit cannot provide universal door-to-door access, ensuring that stops are easily accessible to a large percentage of the public is important to enhancing ridership. Walking and bicycling are already the predominant methods by which people access transit; today only 16 percent of transit customers access public transportation at park-and-ride facilities in Bellevue. Transit's role is not to compete with walking or bicycling, but rather to compete with cars, so it must focus on faster services that are worth walking or bicycling to.

"Transit creates more active communities. People walk more (health benefits)… A good transportation system is fundamental to viability, the city will stagnate, and residents who want that will choose not to live here."

– HAL FERRIS, BELLEVUE PLANNING COMMISSION

"A reliable transit system has sufficient frequency regardless of day of the week or time of day and is within walking distance from home."

– BARBARA, BELLEVUE RESIDENT, CURRENT TRANSIT USER

"I would like for my children to start using a bus to get home from school, but there is no safe pedestrian connection from existing bus stops for them to be able to walk home alone."

– LANA, BELLEVUE RESIDENT, NON-TRANSIT USER

Draft

7 Use urban design and development regulations in Bellevue's major activity centers to support transit use.

While the transit system is designed to serve the City's land use vision it is also important that land use development provide for and encourage transit access and use. This strategy supports expanding transit-supportive urban design and development regulations beyond Downtown and the Bel-Red areas (where these tools are in place) to other major activity centers in Bellevue. This expansion should be coordinated internally with the Department of Planning and Community Development work and regional efforts being led by the Puget Sound Regional Council to develop model transit overlay ordinance language.

"An important benefit of transit is that whenever a transit trip replaces a single auto trip it eases the congestion that hurts all businesses and all commuters. Bellevue could not reach its projected growth without transit. We can't just build roads to meet our growth."

– TOM TANAKA, BELLEVUE TRANSPORTATION COMMISSION

"Allow more commercial and residential density in nodes and corridors with true pedestrian orientation between buildings and transit stops."

– MIKE, KIRKLAND RESIDENT, CURRENT TRANSIT USER

8 Design transit facilities to enhance accessibility, connectivity, and user experience.

The location and design of transit stops, centers, and park-and-ride facilities is an important factor in determining how far pedestrians, cyclists, and drivers must travel to reach transit services and the quality of the wait once they get there. These facilities are the most consistently visible image of a city's transit system. When stops, centers, and park-and-ride facilities are poorly designed, difficult to reach, or uncomfortable for users, it can negatively affect the image of a transit system and reduce opportunities for capturing choice ridership. When local governments partner with transit agencies—as is the case with work underway at the South Kirkland Park-and-Ride, a transit oriented development project that integrates housing within a transit hub—the transit facility environment will enhance connectivity between different modes of transportation and contribute to a positive community identity.

"For those of us who commute into downtown Seattle, it isn't very realistic to catch the bus from our neighborhoods and transfer. So we depend upon the park & rides. It is therefore crucial that adequate parking spaces be provided at the park & rides in order for Bellevue residents to use transit for commuting."

– SARAH, BELLEVUE RESIDENT, CURRENT TRANSIT USER

"If the bus route came closer to where I live I wouldn't need to drive to the Park and Ride. So either the city should have a lot more Park and Ride spaces or have more bus routes in un-served parts of Bellevue."

– PAT, BELLEVUE RESIDENT, CURRENT TRANSIT USER

Draft

9 The only way to efficiently serve multi-centered cities like Bellevue is with routes that are frequent and that make it easy to connect from one route to another at attractive and safe connection facilities.

A transit network is more than the sum of its parts. The usefulness of the network lies in the way all the parts work together, not just how they function individually. A single transit line may be useful for some trips, but it has more value when it is well-connected with all the other lines; a passenger can travel along one line but also to anywhere those connecting lines go. These improved connections contribute to greater coverage and more direct and shorter trips. The transit network should be managed to take into account how all the parts—Link light rail, RapidRide lines, and bus routes—work together to enable people to reach more destinations in less time.

"In Paris and New York City, transit is how I did things. I didn't know my way around, and in Paris couldn't even speak the language, but I had my map so I could do it. If we had a bus system like that with a lot of easy transfers, I would use it."

– HOWARD KATZ, BELLEVUE NETWORK ON AGING

"When the East Link Light Rail is completed, sync bus schedule arrivals with train arrivals / departures so people can get off the bus and not have to wait any more than 5-10 minutes for the train and vice versa."

– TIMOTHY, BELLEVUE RESIDENT, CURRENT TRANSIT USER

10 Invest in transit priority measures along Frequent Transit Network corridors.

The development of transit requires investment. Prioritizing funding for long-term capital projects that improve transit speed, reliability, and capacity in FTN corridors will maximize transit efficiency. Since the adoption of the 2003 Transit Plan, hundreds of millions of dollars in projects have been completed in Bellevue in support of transit. The Transit Master Plan builds on the successes of the 2003 Transit Plan by positioning the City to leverage additional partnerships with regional transit agencies. To secure additional funding, the City may want to: (1) renew and seek new local funding sources to implement Transit Master Plan capital priorities; (2) work with partners to lobby for new transit funding mechanisms, such as tax increment financing, dedication of tolling revenues, and other locally- or regionally-based transit funding sources; (3) create partnerships and leverage private investment to help fund priority capital investments; (4) seek federal and state grants with other agencies.

"The RapidRide B Line is impossibly slow once it gets close to downtown. That bus should have the right of way and traffic signal priority downtown because without it, cars cut it off in rush hour and it is much faster to walk."

– KRISTEN, BELLEVUE RESIDENT, CURRENT TRANSIT USER

"Increase HOV lanes for buses to use to get around rush hour traffic and prioritize signals to allow buses to move through congested areas faster."

– DARYL, BELLEVUE RESIDENT, CURRENT TRANSIT USER

PHOTO BY Guy de Gouville

SECTION 3:
SERVICE ELEMENT

Draft

SERVICE VISION

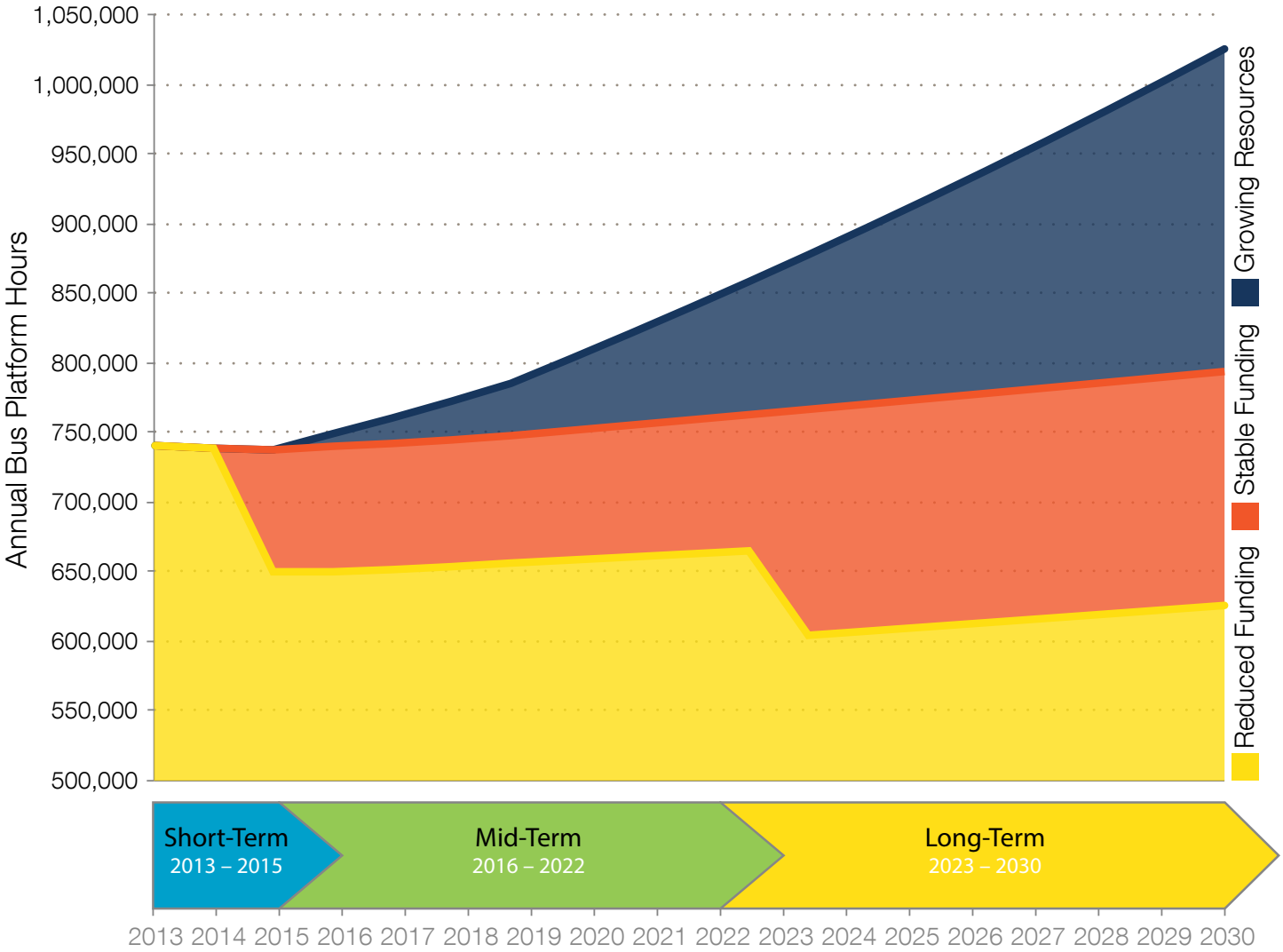
CONTEXT

Metro Service Reductions

Twelve King County Metro routes currently operating in Bellevue are slated for deletion following the April 22, 2014 voter rejection of the King County Transportation District's proposal (Proposition 1) to fund transit and roads with an increased sales tax and an annual vehicle fee. Service reductions affect 27 of Bellevue's 33 Metro routes, accounting for approximately 35,000 daily weekday rides. Metro proposes to phase the reductions over the next four service changes starting in September 2014.

The service vision prepares for uncertainty by advancing a series of proposals to address the city's future transit needs and priorities, including route-level recommendations that are responsive to different financial scenarios (reduced, stable, and growing resources) and attune to different time horizons (short-, medium-, and long-term). The following paragraphs provide a synopsis of each scenario's intent. For additional details about their definition, refer to the *Funding Scenarios Report.*

Figure 69 Projected future bus service funding scenarios. With the defeat of Proposition 1 on April 22, 2014, the region is currently on the Reduced Funding trajectory.



Draft

Time Horizons

Because of the many significant changes Bellevue will undergo in the coming years, including considerable growth, the emergence of new activity centers (e.g. Bel-Red), the start of East Link light rail operations, and the completion of other major regional transportation investments, it is important to consider both how transit will function when the system is fully operational in 2030 and the incremental steps that will need to be taken to bring that vision to fruition.

Planning for 2030 considers Bellevue's transit needs in the context of all of the developments noted above. Planning for 2022 addresses growth in demand through the final year in which buses constitute the only transit service operating in Bellevue. Finally, planning for 2015 considers what steps can be taken in the short-term to pursue the long-term vision in the context of uncertain transit funding and without the benefits of new infrastructure investments.

Short-Term: 2013–2015
Planning for the next two years, including both minor adjustments that enable incremental steps toward the long-term service vision and potentially significant service reductions beginning in 2014.

Mid-Term: 2016–2022
Includes planning for the impacts on traffic circulation and transit operations of the construction of East Link, SR-520, I-405, potential I-90 tolling, and land use developments in Bellevue.

Long-Term: 2023–2030
Focuses on Bellevue's transit needs in the context of considerable growth, the emergence of new activity centers (e.g. Bel-Red), the start of East Link light rail operations, and completion of major regional transportation investments.

Funding Scenarios

Since the elimination of the Motor Vehicle Excise Tax (MVET) as a revenue source for local transit agencies in 1998, transit agencies have increasingly relied on unstable local sales tax revenue to support their operation, the only substantial source available. The vulnerability of this source of revenue to changing economic conditions makes it difficult to plan future transit services within reasonable fiscal constraints.

Because the state of transit funding cannot accurately be predicted for any given time, this plan considers three distinct funding scenarios for each time horizon to address the fullest range of potential outcomes. The proposals advanced by the TMP will therefore be more readily adaptable to changing circumstances over the course of the plan's twenty-year implementation period. As of April 2014, Bellevue is currently on the Reduced Funding trajectory.

Reduced Funding:
A financially-constrained outlook for the future of bus service in Bellevue, this scenario includes two one-time reductions in annual service. The first is a 17 percent decrease in Metro platform hours in 2014, consistent with Metro's projected funding shortfall absent new funding, followed by a 29 percent reduction in ST Express service in 2024, reflecting reallocation of resources from bus to East Link light rail.

Stable Funding:
A continuation of the status quo with no significant reductions or expansions of bus platform hours. Annual increases of 0.5 percent are applied to account for schedule maintenance, and ST Express bus service is retained, albeit reconfigured, following the introduction of East Link light rail in 2023.

Growing Resources:
The most significant departure from current transit operations in Bellevue. An growth rate of 2.25 percent is applied, reflecting the annual increment needed to reach PSRC projections that suggest a near doubling of demand for transit (and the resources expended to meet this demand) by 2040.

Draft

Cost Baseline

The budget constraint for each scenario, as defined in the *Funding Scenarios Report*, is based on the current universe of routes—both Metro and Sound Transit Express—that had at least one stop in the City of Bellevue in Spring 2012, which equates to 740,880 annual platform hours.[1] This budget includes extensive services that also operate in other cities, and should not be confused with any notion of "Bellevue's share" of regional transit resources. The Bellevue Transit Master Plan does not intend to make strong recommendations about what the Kirkland and Redmond networks should look like. However, the three cities' networks are highly interdependent and will eventually need to consist of a single design over the entire three-city area. At this stage, the appropriate position for a Bellevue TMP is to recommend a network that makes sense for Bellevue, that connects the three cities effectively, and that is broadly fair to all three cities in terms of resource distribution.

Construction Mitigation

The service vision includes proposed network design scenarios for 2022, the year just before East Link opens. However, East Link construction impacts could not be studied in the context of this report, because Sound Transit was not yet able to provide sufficiently detailed and reliable descriptions of the likely impacts. Construction often requires temporary closures of important facilities such as connection points, park-and-rides, and travel lanes, the most serious of which are likely to be at the South Bellevue Park-and-Ride. These closures can impact transit's speed, reliability, and general usefulness, and a mitigation plan is required to balance impacts between transit, motorists, bicycles, and pedestrians.

1 Note that Routes 219 and 925 are excluded from the Spring 2012 Baseline Network. See the *Funding Scenarios Report* for details.

Draft

Service Types

New service categories have been defined to more effectively communicate the distinctions between the service types included in these networks. The core idea used to define service categories is that transit's usefulness is particularly tied to three features: frequency and span, the speed-access tradeoff, and reliability. Five of the categories depicted in Figure 70 appear in the proposed 2030 Growing Resources scenario.

- **Frequent Express** are similar to existing ST routes 550 (Bellevue-Seattle) and 545 (Redmond-Seattle). They run mainly on freeways and make widely spaced stops, with long non-stop segments along freeways. Average stop spacing exceeds 1 mile on freeway segments, and is kept around 1/2 mile when running on arterials unless there is a compelling need to stop more closely.
- **Frequent Rapid** is similar to RapidRide, running mostly on arterials with very high frequency. Stop spacing tends to be 1/4 to 1/2 mile, usually close enough to not require an underlying local service to stop more frequently, but wide enough to be notably faster and more reliable than a local.
- **Frequent Local** is standard local bus service at high frequency, with stops every 1/8 to 1/4 mile.

The above three categories are collectively called the Frequent Transit Network (FTN), which is the network of services most useful to most people. The two remaining service types are **Infrequent or Secondary Local** services, which serve the purpose of providing coverage where low ridership is expected, and **Peak Express**, which are expected to decline as a share of all services but will continue to be needed in corridors where a large surge in demand happens only during the peak commute.

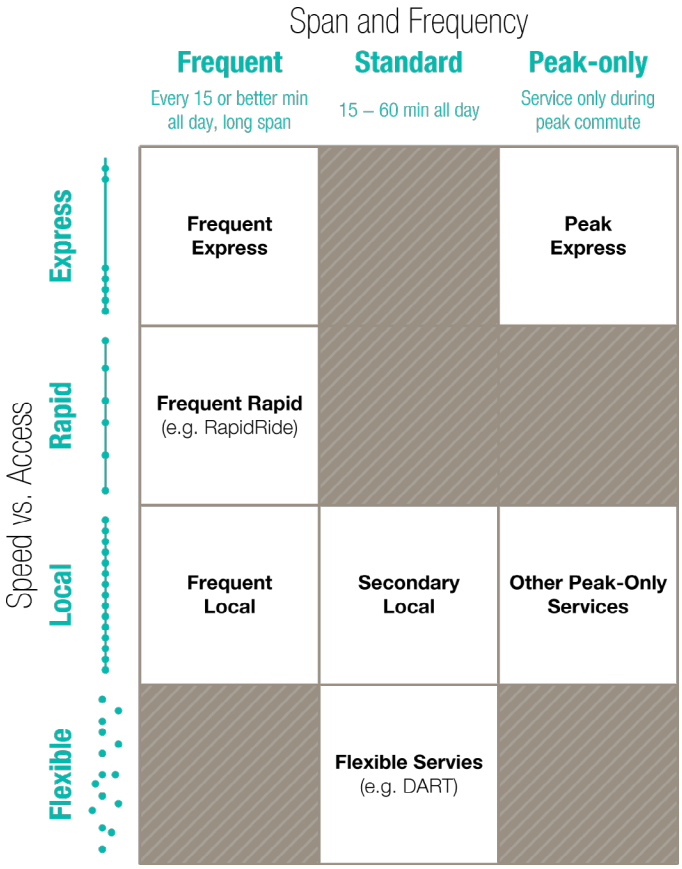


Figure 70 Types of transit service, as defined by frequency and span, the speed-access tradeoff, and service reliability.

Draft

PROPOSED NETWORKS

Stemming from its consideration of multiple time horizons and funding scenarios, the service vision proposes a total of nine future transit networks. Figure 71 provides a matrix of the connection opportunities offered by each of the proposed future transit networks, as well as the service frequencies operated between each activity center in Bellevue and the surrounding region.

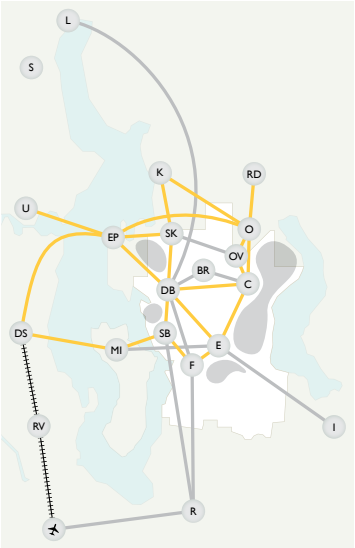
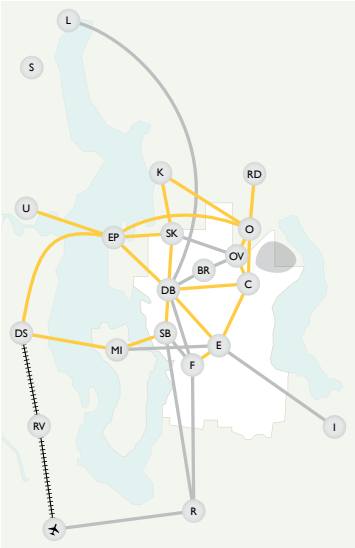
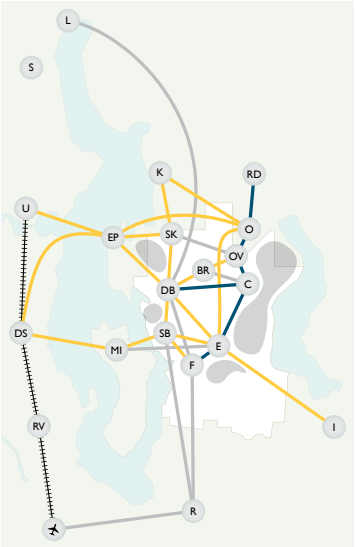
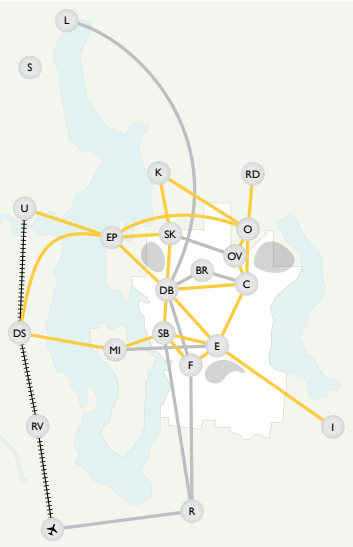
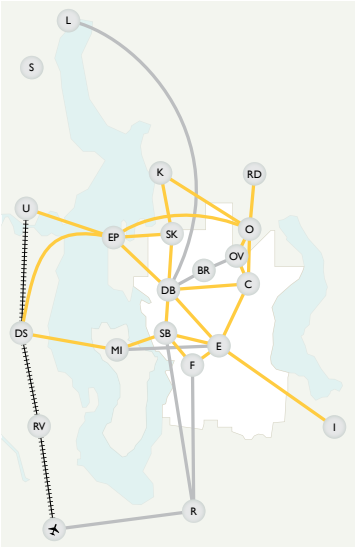
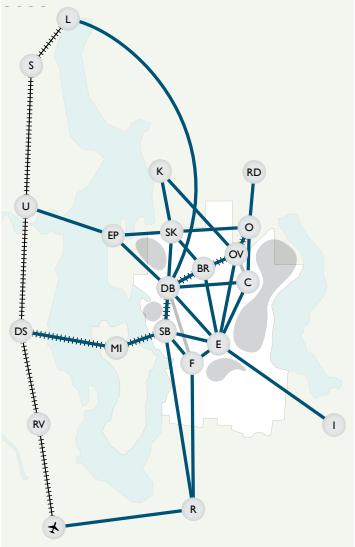
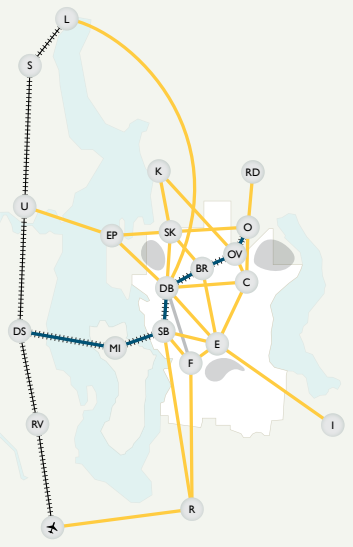
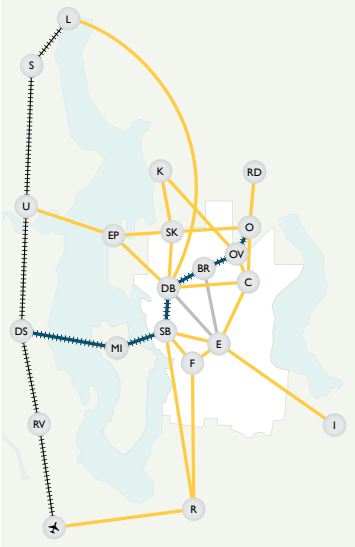
The 2030 Growing Resources network may be regarded as the ideal scenario, offering a comprehensive, well-connected grid network of very frequent all-day service, wide-reaching supplementary coverage service, and multi-modal integration wherein buses operate as frequently as East Link light rail to ensure short waiting times when transferring. All other scenarios are either incremental steps building toward that goal over time or a compromise attempting to provide the nearest approximation of that vision given constrained resources. Therefore, when comparing the three Growing Resources networks over the three time horizons, a clear progression toward greater connectivity and higher frequency can be identified with each subsequent phase. The same can generally be said for the progression of the Stable Funding networks, though the improvements are more incremental in nature. However, because the Reduced Funding scenario experiences a loss of resources with each subsequent period, the 2030 network represents a worst-case scenario in which all coverage service is eliminated in an effort to maintain some semblance of frequent service between major activity centers and coordination with the multi-billion dollar investment in regional light rail. This section presents each of the proposed future transit networks and briefly describes their defining characteristics.[2,3]

2 For more information, refer to the *Transit Service Vision Report.*

3 Refer to Appendix 3 on page 108 for an overview of how the available resources of each of the 2030 scenarios are divided amongst the various service types in terms of annual platform hours and the percentage split.

Figure 71 (Opposite) These diagrams depict the connections and their associated frequencies offered by each of the nine proposed future transit networks.

Draft

	Growing Resources	Stable Funding	Reduced Funding
2015 Short-Term			
2022 Mid-Term			
2030 Long-Term			

2030

BELLEVUE
- **BR** Bel-Red
- **C** Crossroads
- **DB** Downtown Bellevue
- **E** Eastgate
- **F** Factoria
- **SB** South Bellevue Park & Ride

REGION
- **DS** Downtown Seattle
- **EP** Evergreen Point
- **I** Issaquah Transit Center
- **K** Kirkland Transit Center
- **L** Lynnwood
- **MI** Mercer Island
- **O** Overlake Transit Center
- **OV** Overlake Village
- **R** Renton
- **RD** Redmond Transit Center
- **RV** Rainier Valley
- **S** Shoreline
- **SK** South Kirkland Park & Ride
- **U** University District
- SeaTac

	Peak	Midday	Night
Very Frequent (every train connection)	≤8	≤12	15-30
Frequent	10-15	15	15-30
Infrequent	30	15-30	30-60

Note: numbers reflect approximate peak/midday/night frequencies.

LRT

Draft

2030 Service Vision

The three networks comprising the 2030 Service Vision represent the widest range of potential outcomes between the various funding scenarios. The Growing Resources scenario is the most optimistic considered by the TMP, while the Reduced Funding scenario is the most financially constrained of any of the nine networks proposed.

2030 Growing Resources

The 2030 Growing Resources scenario envisions a growth in total bus operating resources of 38 percent by 2030 from Spring 2012 service levels. The BKR travel demand model anticipates that transit demand will triple by this time, so even this growth in service—less than a doubling—will mean that average loads and average productivity (passenger boardings per hour of service) must also increase. This means that even in this most abundant scenario, it is important to focus on more efficient service deployment to ensure that there is adequate supply where demand is high.

Buses will have to be larger and deployed with a priority to serving high demand corridors efficiently. This means that service duplication must be avoided, and as the network grows more frequent it will become more dependent on fast, reliable connections. The network will have to make maximum use of East Link's high capacity by encouraging connections to Link rather than duplicating any part of it. The expectation of many commuters that they will have a single-seat ride from origin to destination will simply not be viable when this level of demand must be accommodated.

One notable improvement that is affordable only in the Growing Resources scenario is here referred to as "every-train connections," provided by routes comprising the Frequent Transit Network (FTN) shown in Figure 72. East Link frequencies are expected to be every 8 minutes peak, every 10 minutes midday, and every 15 minutes in the evening. All Frequent Rapid and Frequent Local services will match this

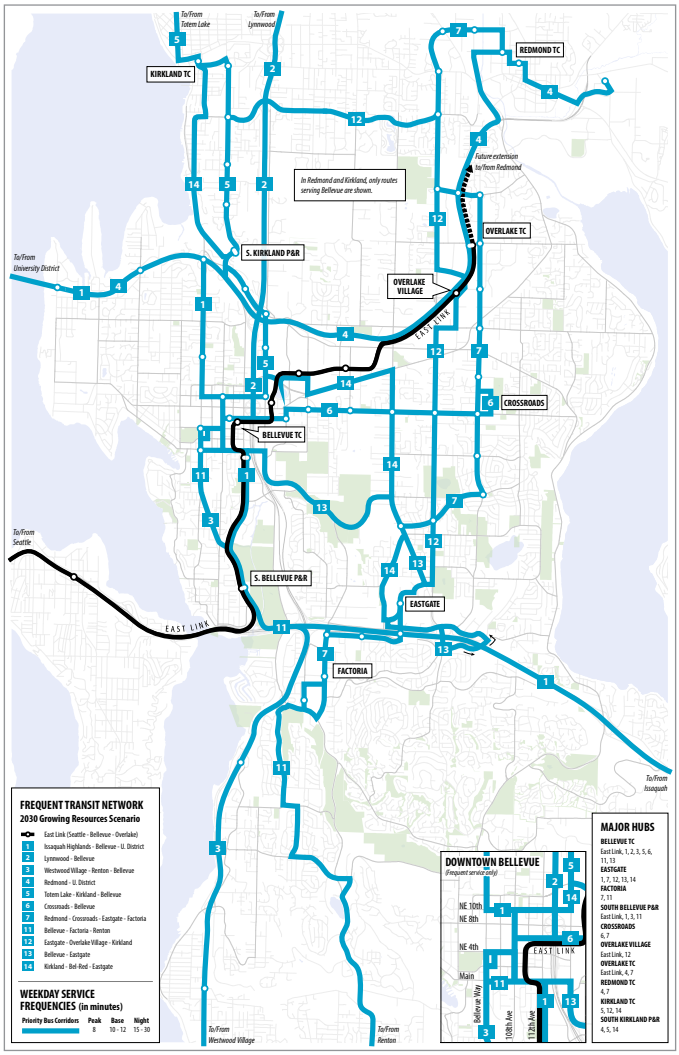
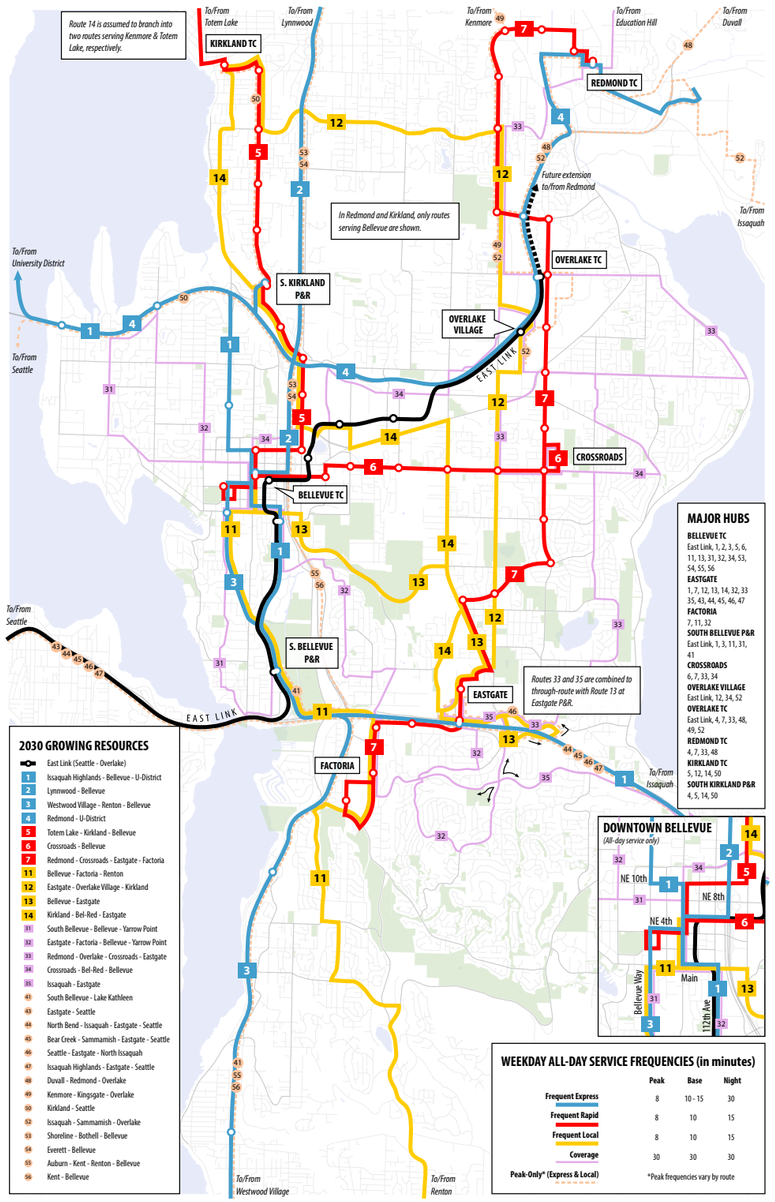


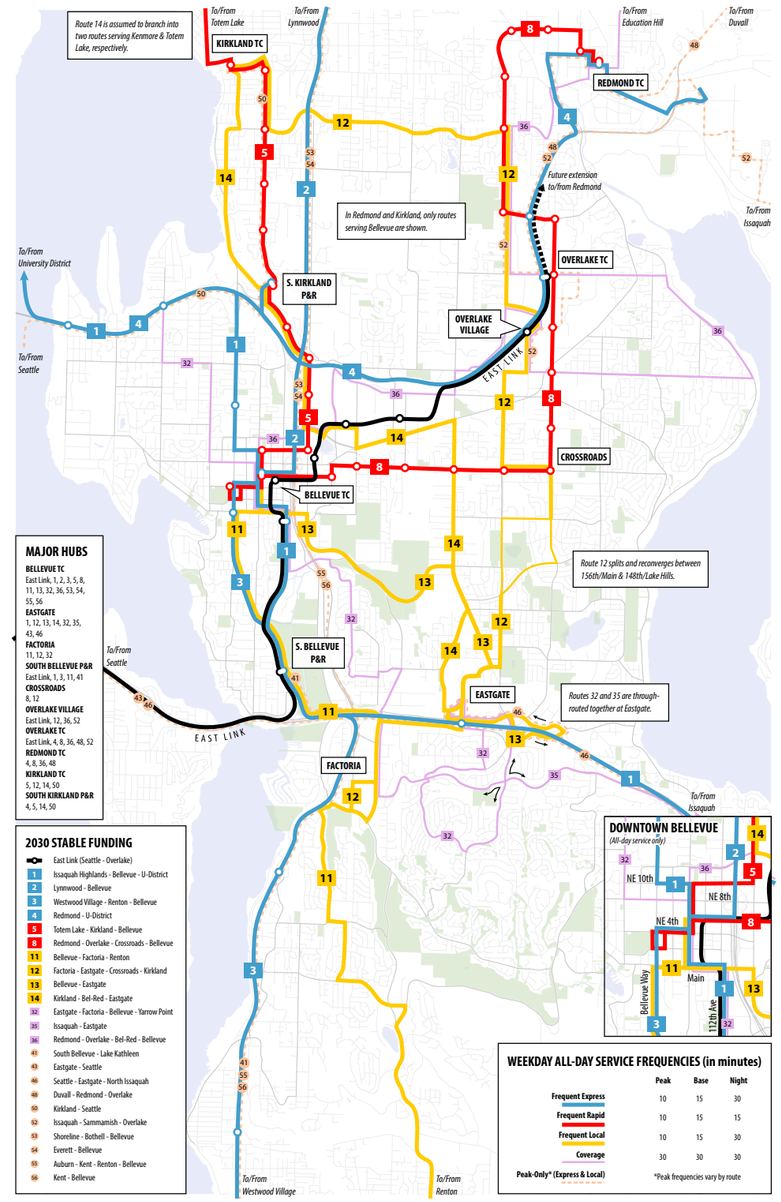
Figure 72 The 2030 Frequent Transit Network (FTN), based on the Growing Resources Scenario, represents the core service vision being persued by the Transit Master Plan.

Draft

2030 | Growing Resources



2030 | Stable Funding



2030 | Reduced Funding

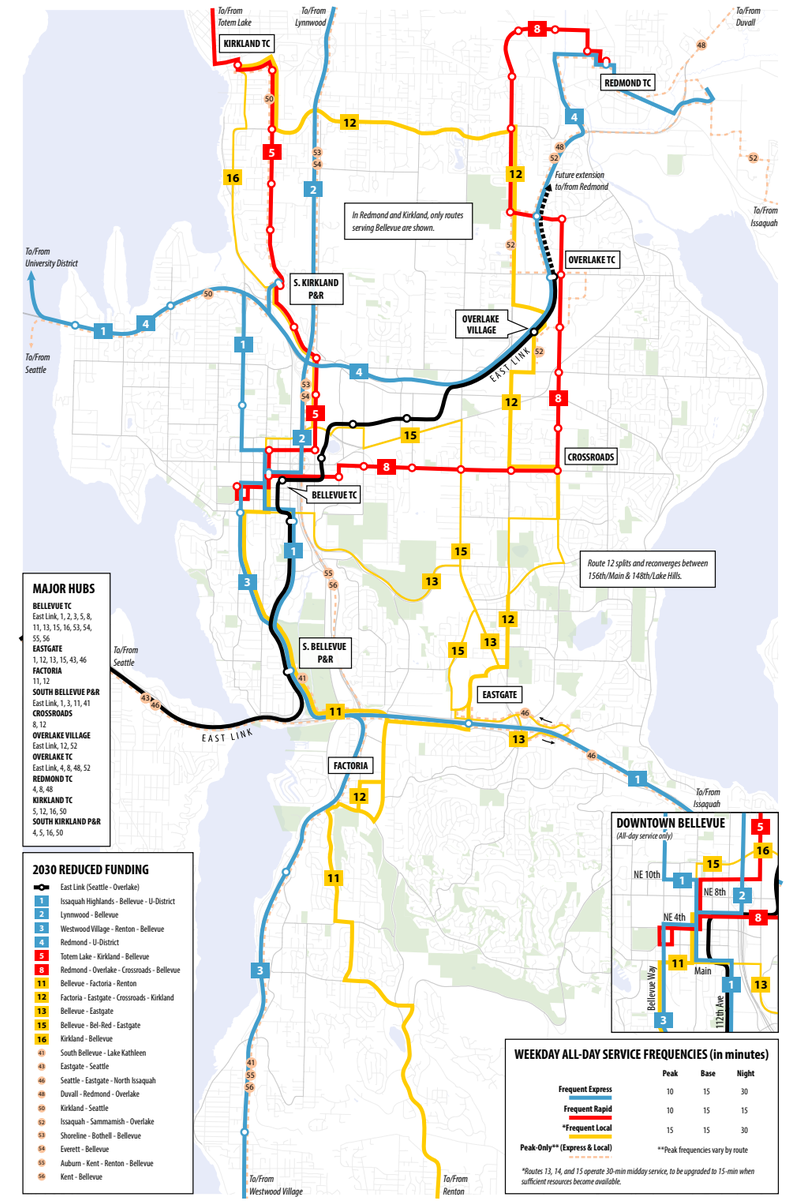


Figure 73 2030 Proposed Network Maps. Route-level details are available for each funding scenario in the *Transit Service Vision Report*.

Draft

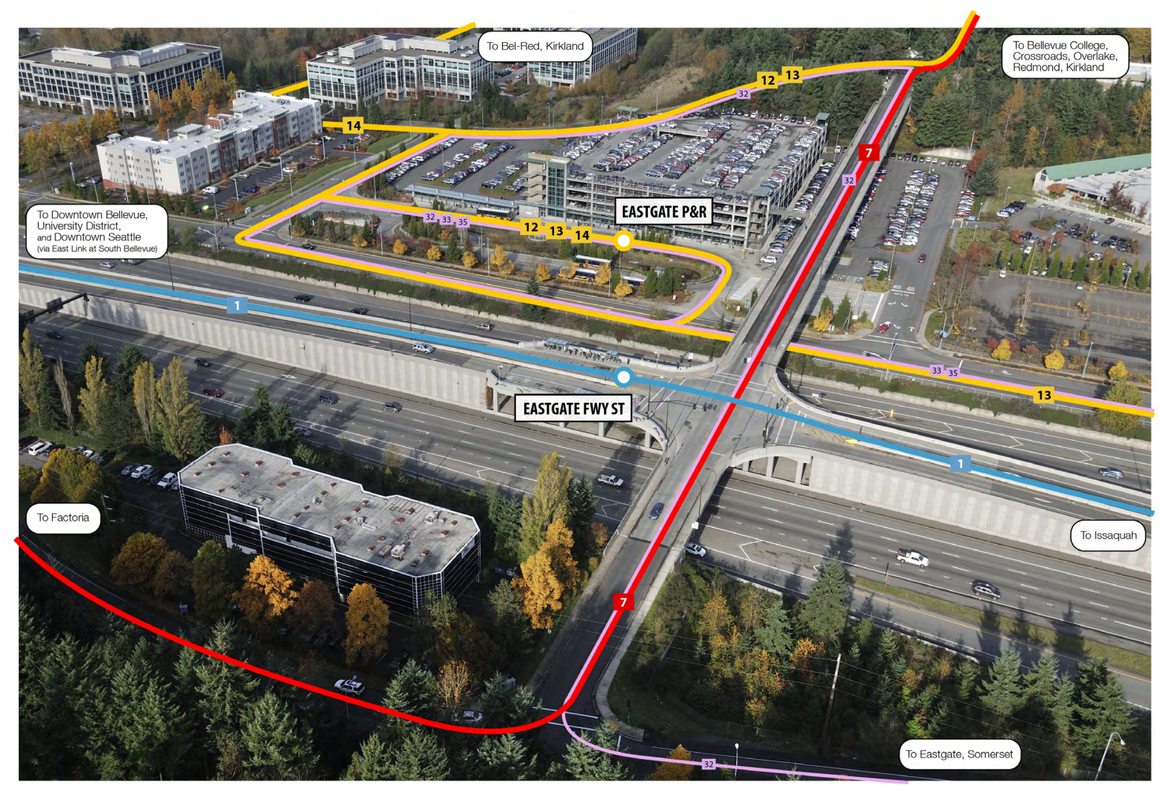
Unfold for full-size map

frequency during all times of the day, and Frequent Express services will match it during all times except in the evening. Thus, most FTN services throughout Bellevue will match East Link frequency so that every train trip has its own connecting bus trip. These may not always be waiting for the train, but they will come within a few minutes after each train arrives.

The need to support much higher demand has an impact on coverage services, where demand will be lowest and will grow most slowly. In the Growing Resources scenario, the current level of coverage deployed around Bellevue is assumed to remain. Coverage route frequencies are standardized at 30 minutes throughout the day and evening—much better than they currently offer. The coverage area is neither expanded nor reduced, despite low ridership on many of the coverage segments. The overall percentage of Bellevue residents and jobs covered by transit improves by 2030, but not because coverage is expanded. Rather, this happens because the majority of new residents and jobs added to the city are located along the FTN.

Coverage services focus on low-density areas or areas with difficult street patterns where low ridership can be predicted regardless of the service provided. Coverage areas that are served typically have continuous but low-density development (entirely or almost entirely single-family) and often also have somewhat difficult but not impossible street patterns for transit. In the Growing Resources scenario, all of the existing coverage area is retained; however, some current routes are partly coverage and partly on the proposed FTN, so these are restructured so that they better complement the FTN without duplicating it.

Although the TMP envisions a greater emphasis on the core all-day network of transit services in



Draft

Bellevue, the accommodation of peak trips remains an important consideration in designing the long-term scenarios. To ensure that peak commute needs are being met, the peak networks assumed in the long-term scenarios are designed so that planned vehicle capacity in the cross-lake and I-405 corridors can accommodate any anticipated growth in future passenger loads. However, the robust Frequent Express network proposed for 2030, combined with East Link and North Link, changes the route structure of peak express services. Currently, these services often directly connect remote residential areas with large employment centers, creating many complex and overlapping route patterns. In the future, the much simpler Frequent Express and Link services will form a framework on which many of these trips can be routed. These trips may require a connection, unlike existing services, but very frequent FTN services will ensure short wait times, and this will allow for a much more efficient deployment of capacity and thus a higher-capacity and higher-ridership network overall.

One key focus is to ensure that if Link is useful for a portion of an existing peak express trip, that service is restructured to truncate at East Link or North Link so long as the total travel time is reasonable. This eliminates the need for direct services from the Eastside to Northgate or Ravenna and even some trips between the Eastside and Downtown Seattle on SR-520. As the most abundant scenario, the Growing Resources scenario is the most generous in retaining peak express services.

2030 Stable Funding

The Stable Funding scenario presumes that service resources remain near the current level, growing only with a low level of inflation. In this scenario, the only moment when any significant growth in resources occurs comes with the opening of East Link in 2023, when the existing Route 550 is replaced by light rail and its resources can be reinvested elsewhere in the bus system. The Stable Resources scenario does

Figure 74 (opposite) Transit services at the Eastgate Park-and-Ride and Eastgate Freeway Station in 2030 based on the Growing Resources network. Frequent connections are available to Bellevue College, Crossroads, Downtown Bellevue, Factoria, Issaquah, Overlake, Redmond, and Kirkland.

Draft

not mean "status quo" in any sense. In this scenario, Bellevue's transit demand grows dramatically, yet resources do not increase accordingly to meet that growth. The only way to face this situation is to reduce the low-ridership Coverage services.

Coverage services are pared back to only those that serve higher concentrations of jobs or housing. An alternative approach would have been to retain all coverage routes but cut them to operate hourly at most times of day. This would have ensured very low ridership but retained the provision of lifeline access. The proposed Frequent Rapid service between Crossroads and Eastgate (Route 7) is deleted, leaving only Frequent Local Route 12 service along this segment. Frequencies operated by the FTN are reduced but remain at 15 minutes or better all-day, except in the evening. This is adequate capacity to handle projected crowding across the lake, but some overcrowding is likely even if high-capacity buses are used consistently. Finally, four low-performing peak-only routes are eliminated, including Routes 44, 45, 47, and 49, consistent with those identified by King County Metro in April 2013 as candidates for potential elimination.

2030 Reduced Funding

In the Reduced Funding scenario for 2030, Bellevue's overall transit demand more than doubles, but the resources available for bus service are 15 percent less than what they are today. East Link is added, but unlike in the higher resource scenarios, the bus service East Link replaces (primarily Route 550) is removed from the budgeted resources. In the context of a more than doubling of Bellevue's transit demand, transit falls far behind the expectations of all cities in the region and severely disappoints most of its stakeholders. Transit inevitably competes less effectively with the car and loses market share, though some of this loss will be to walking, bicycling, car-sharing, and other non-SOV options. In this context, transit must narrow its focus to the highest-demand markets where the available resources can

Draft

achieve the most ridership—and thus the most regional mode shift—and those where there is no reasonable non-automobile alternative.

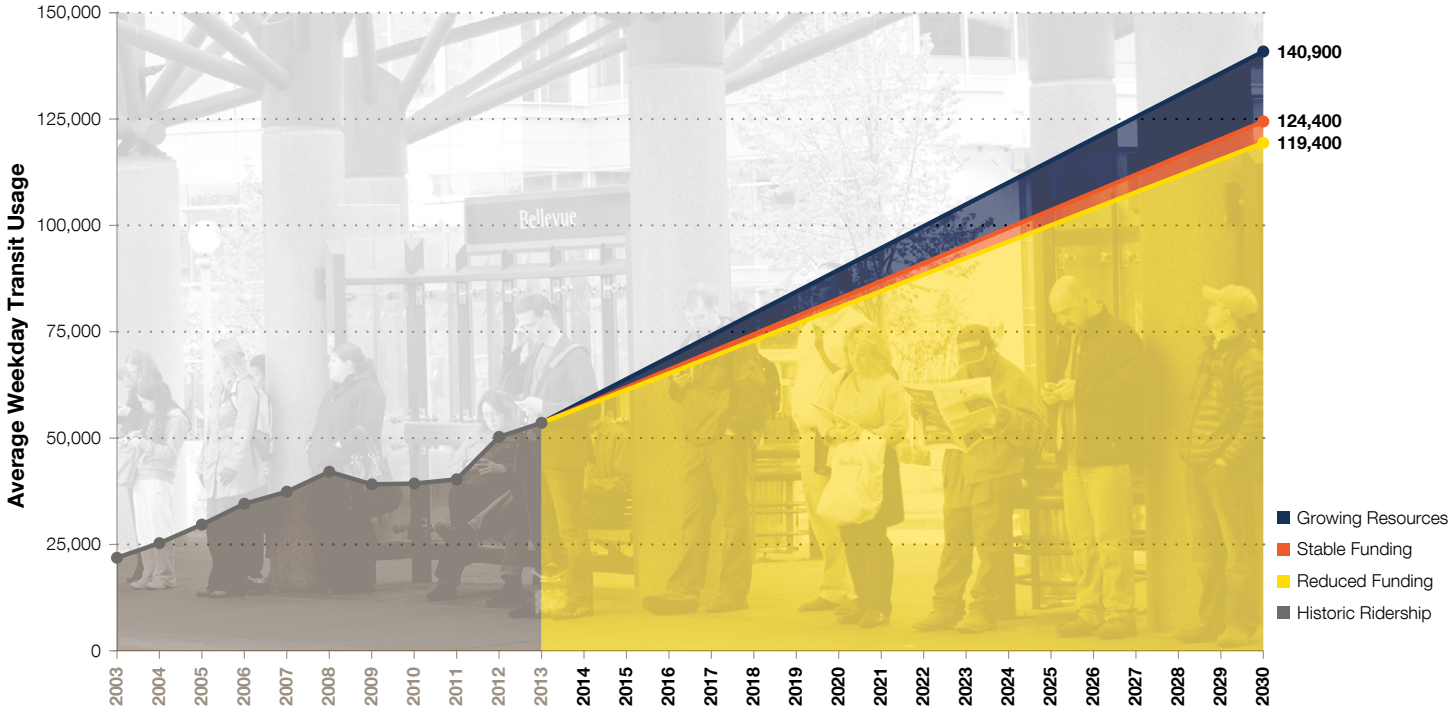
The FTN route structure is unchanged from the Stable Funding scenario, and Frequent Express and Frequent Rapid services are retained at the same frequencies. By contrast, the Frequent Local network—aimed at shorter trips that are more likely able to shift to walking or bicycling—must be cut substantially. Some of these (indicated by narrower lines on the map) will operate frequencies of only every 30 minutes midday, which are meant to be upgraded when sufficient resources become available. These markets, which make good use of transit's high capacity and serve trips that are too long for most people to walk or bicycle, become the most important role a diminished transit system can serve in being relevant to the regional access and sustainability.

In such a financially starved scenario, Coverage services, which can expect consistently low ridership, must be eliminated entirely, as even operating hourly service would require too many resources to maintain these services without significantly affecting the FTN. The urgency of meeting high-ridership needs and managing overcrowding would be the dominant regional transit concern, leaving no resources for low-ridership coverage areas. Because the Stable Funding scenario already reduces Peak Express services to the minimum amount deemed tolerable to ensure adequate capacity, no further cuts to these services are made in the Reduced Funding scenario.

2030 Projected Outcomes

Figure 75 shows how average daily ridership compares across the three 2030 scenarios and to the trend exhibited between 2003–2013. As indicated, ridership is projected to more than double regardless of which scenario is realized, but implementation of the Growing Resources scenario will result in a near-tripling of daily ridership. Because the lower-resource scenarios retain high-ridership FTN service to the extent possible, with most eliminations being targeted to lower-ridership Coverage and Peak services, the projected ridership is not impacted as significantly as it could be; however, the social service aspect of these networks is considerably reduced.

Figure 75 Average daily ridership from Fall 2003–2030 in Bellevue, reflecting projected variation based on implementation of the Growing, Stable, and Reduced Funding scenarios.



Draft

2022 Service Vision

The three networks proposed for 2022 can be thought of as intermediary networks that are intended to move service in the direction of the long-term vision, anticipating the arrival of East Link light rail to the extent that available resources allow. Although the differences between the Growing Resources and Reduced Funding scenarios are less dramatic than in the 2030 networks, the implementation of these scenarios would have significantly different implications for the availability of transit service in Bellevue.

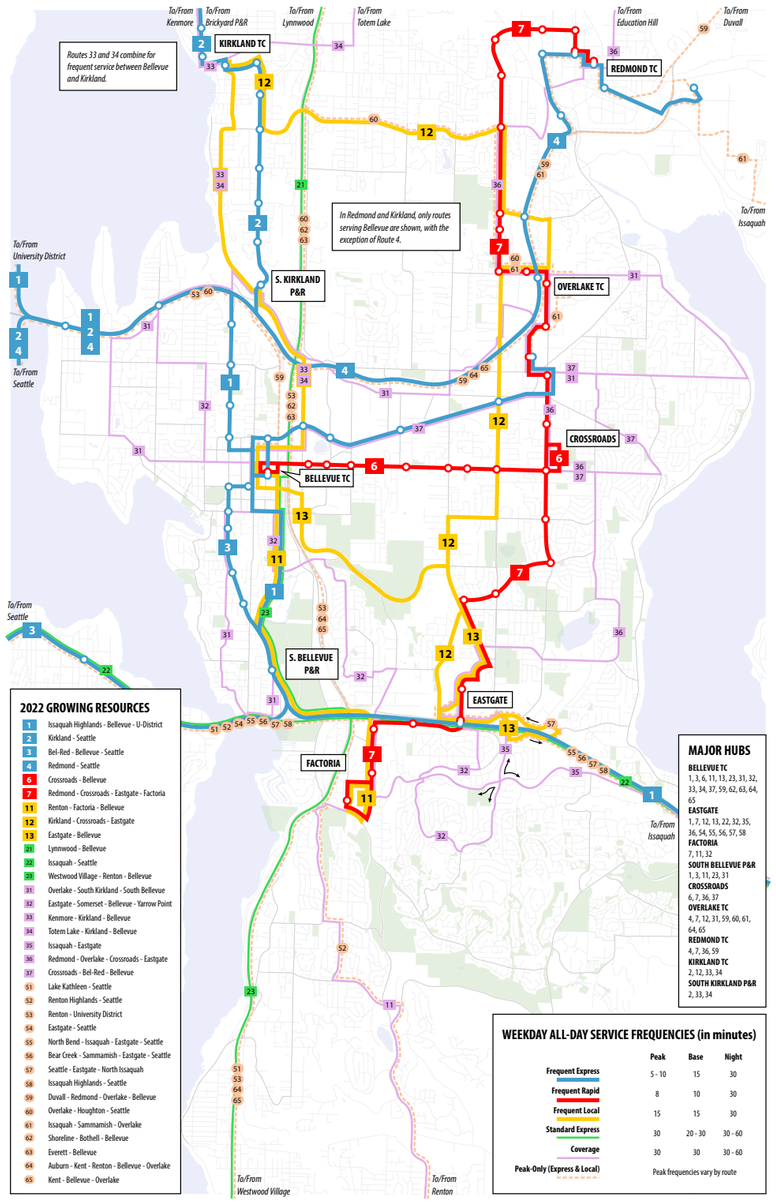
2022 Growing Resources

In the 2022 Growing Resources scenario, it is possible to implement many of the local and regional improvements envisioned in the 2030 Growing Resources scenario. This includes the development of a grid of high frequency service, composed . On the east side of Bellevue, separate north-south lines running at high frequency all day serve 148th Ave NE (Route 12) and 156th Ave NE (Route 7). Easy north-south travel on the east side of Bellevue means easier access to Bellevue and Redmond employers from growing areas to the south and from Issaquah. It also means easier access from these employers to Bellevue College, Eastgate employment areas, and Factoria. Coupled with these frequent north-south corridors in eastern Bellevue are frequent east-west services on Bel-Red Road (Route 1), NE 8th St (Route 6), and Lake Hills Connector (Route 13). The key feature of a high frequency grid is that travel is possible between any two points via a reasonably direct path, which allows the focus of transit to be on providing broadly useful service for a wide range of possible trips.

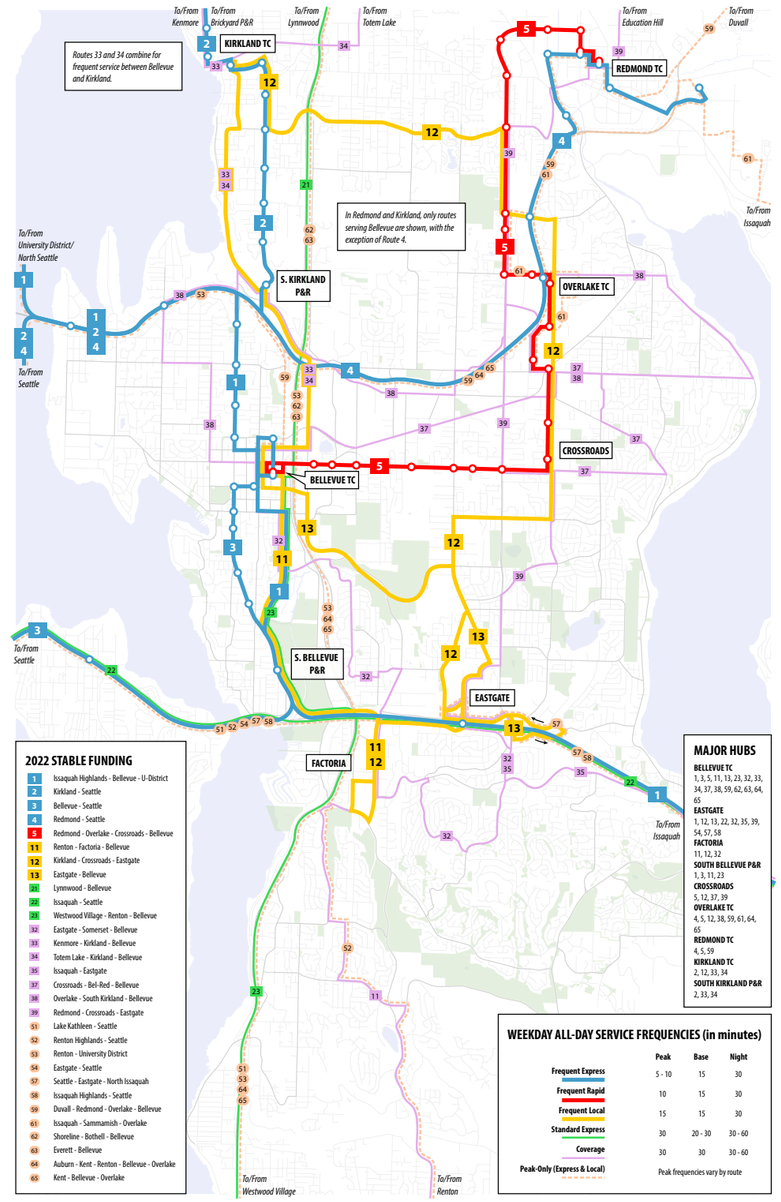
Another notable feature of the 2022 Growing Resources scenario is the extension of Frequent Express service to the future station areas in the Bel-Red corridor to Overlake Village to approximate the forthcoming East Link service. Existing Route 550,

Draft

2022 | Growing Resources



2022 | Stable Funding



2022 | Reduced Funding

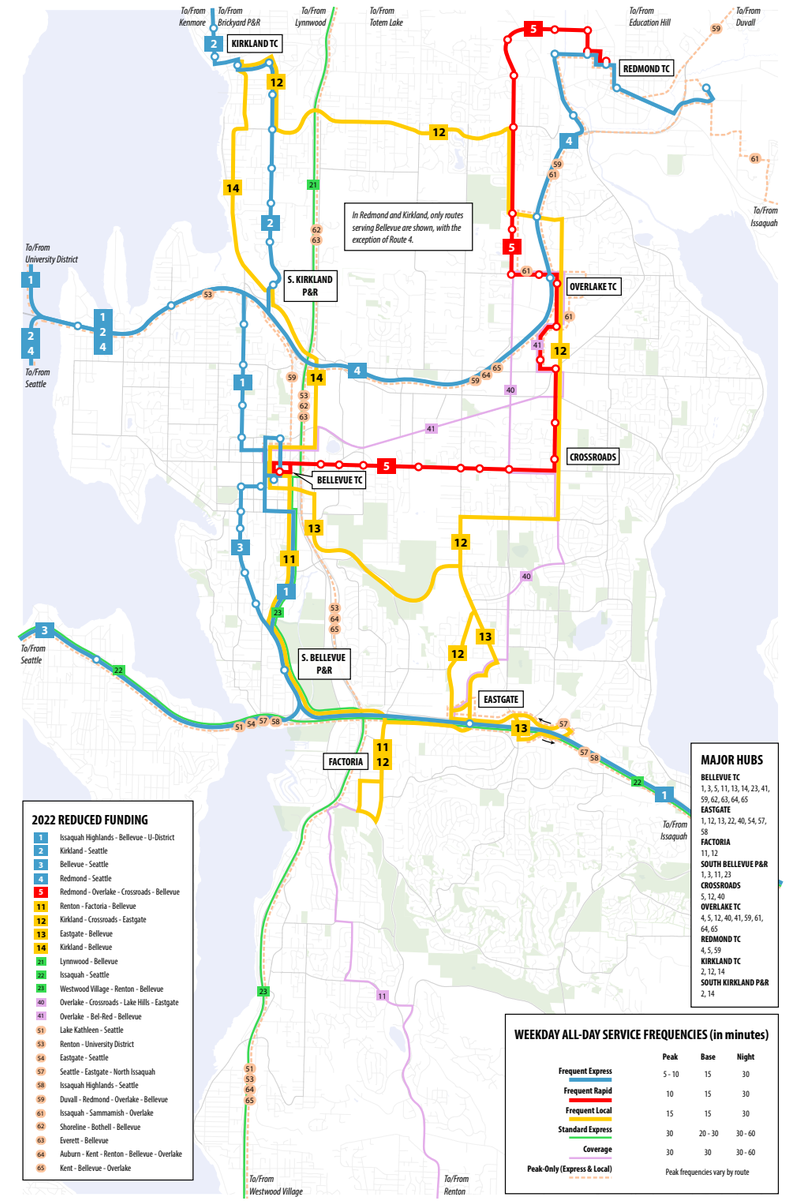


Figure 76 2022 Proposed Network Maps. Route-level details are available for each funding scenario in the *Transit Service Vision Report*.

Draft

Unfold for full-size map

which currently ends in Downtown Bellevue, is here referred to as Route 3 and is extended eastward to Overlake Village via Bel-Red Road. This service could help form the basis for early wins in the redeveloping Bel-Red corridor by encouraging the development of transit-oriented emplyoment prior to East Link's completion. Although this extension concept can only be afforded in the 2022 Growing Resources scenario, the possibility of a Bel-Red local improvement district—or other similar local revenue source—could be studied to help fund this temporary service

In the Growing Resources scenario, all areas currently served by transit would continue to be served by restructured Coverage services. Standard all-day express service, which would operate less frequently than Frequent Express services, is proposed along the north and south I-405 corridor and along I-90 between between Issaquah and Seattle. A generous Peak Express network is also retained in the Growing Resources scenario.

2022 Stable Funding

The 2022 Stable Funding scenario has only slightly more resources available than the current network, yet it must accommodate a growing demand for transit in Bellevue, particularly in the city's denser activity centers. As a result, coverage service must be reduced somewhat to ensure that adequate frequency can be retained where it will be heavily used and where the livability of transit-oriented development relies upon it. The following are some notable differences from the Growing scenario.

The Growing scenario's extension of existing Route 550 service into Bel-Red is not included in the Stable or Reduced Funding scenarios. However, as noted, the city may wish to consider other means of funding this temporary service if it is deemed important to the early redevelopment of the Bel-Red station areas. Frequent Rapid Route 7 connecting Redmond, Overlake, Crossroads, Eastgate and Factoria is also not affordable in the Stable Funding scenario, and is

Draft

replaced by a Frequent Local north-south line (Route 12), similar to existing Route 245. The Frequent Rapid network is thus limited to a single line (Route 5) that is identical to the existing RapidRide B Line. Additionally, it is not possible to provide frequent service with the available resources, so north-south access in east Bellevue and the high-frequency grid proposed in the Growing Resources scenario are not offered by the Stable or Reduced Funding scenarios.

Coverage service is reduced somewhat compared to that offered in the Growing Resources scenario, but the only areas that experience a total loss of coverage are the areas east of 156th Ave between I-90 and NE 8th St and portions of Clyde Hill and Medina along 84th Ave NE. Peak Express services are also trimmed, requiring some peak commuters to make connections while still ensuring adequate capacity for all regional and local commute trips.

2022 Reduced Funding

The 2022 Reduced Funding scenario recommends how transit service should be allocated in a situation where limited resources require significant cuts at the same time that transit demand is growing and a larger share of Bellevue's economy relies on transit. In this dire situation, it is difficult to justify services that cannot generate high ridership and services that provide only marginal increases in convenience over other services that are also available. As a result, the cuts envisioned in the 2022 Reduced Funding scenario elimiante services devoted to covering low-density and no-growth areas. These are permanently low-ridership services, and retaining them in the face of so few resources would require cutting services that are much more important to the livability and economic competitiveness of Bellevue's growing dense areas. Peak express routes that duplicate other services are deleted, and while this will require connections for some riders, the urgent need in such an impoverished scenario is to retain regional mobility and adequate capacity.

Draft

2015 Service Vision

The 2015 Service Vision provides guidance for near-term actions that can begin moving Bellevue's transit network toward the long-term vision while remaining sensitive to the existing route structure and a desire to not alter it too radically too quickly. The Growing Resources and Stable Funding scenarios are almost identical because the resource expansion rate assumed under the Growing scenario has not had time to grow significantly by 2015, so the difference between these scenarios is only 1 perrcent.

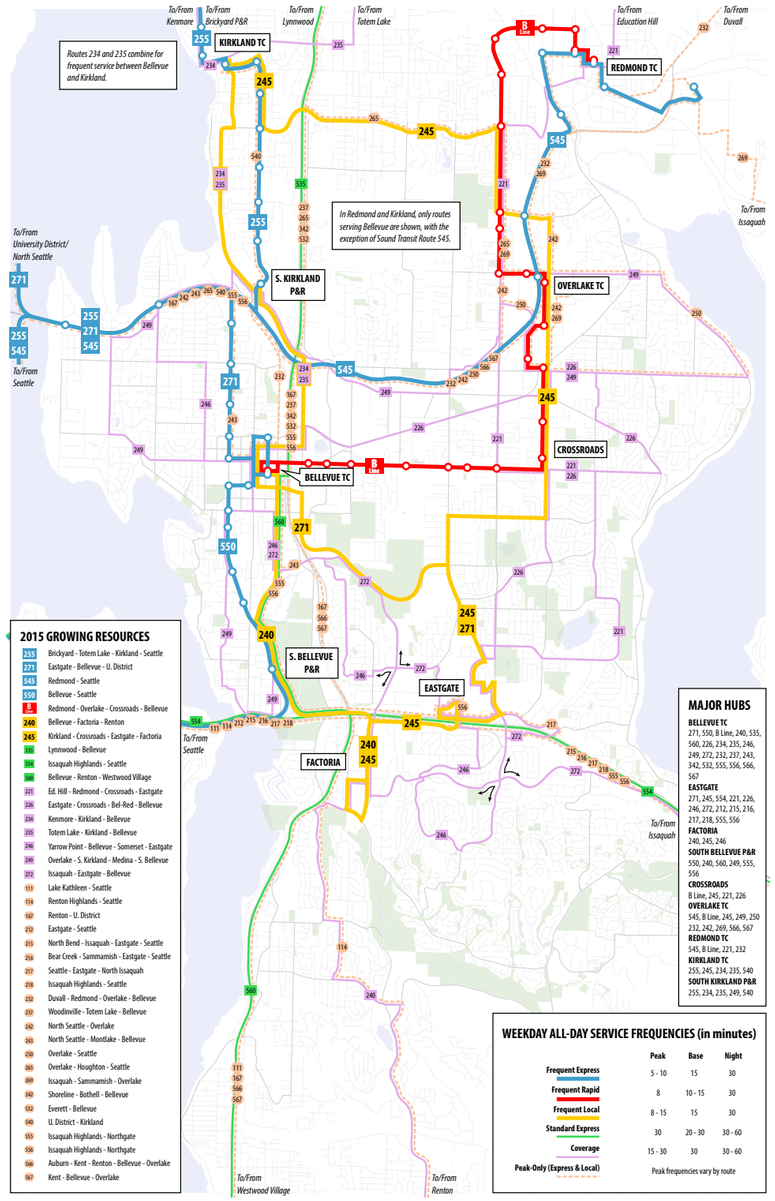
The key issue distinguishing these two similar visions from the Reduced Funding scenario is whether or not a new source of operating funds is implemented to stabilize King County Metro's budget. Following the elimination of the MVET in 1998 and the recession in 2008–2009, King County Metro has encountered funding shortfalls on several occasions, which it has responded to by improving operational and administrative efficiency, raising fares, and other changes. Despite these efforts, the temporary Congestion Reduction Charge (CRC) implemented in 2012 will expire as scheduled in 2014, resulting in a 15.7% funding shortfall. In April 2014, King County voters rejected Proposition 1, which would have provided dedicated transportation funding to preserve current Metro service levels by levying a 0.1% sales and use tax and a $60 vehicle fee, each for up to ten years.[1] Metro will therefore implement service reductions of 550,000 annual service hours system-wide between September 2014 to September 2015, so barring the implementation of a new source of funding in the coming months, Bellevue is currently on the trajectory of the Reduced Funding scenario. King County Metro's current proposed reductions are different in several areas from Bellevue's Reduced Funding scenario, so the City will work with Metro in an effort to reach a compromise reduction strategy.

Figure 77 King County Metro Route 243 is one of twelve Bellevue routes slated for deletion following the April 22, 2014 rejection of King County Transportation District Proposition 1.

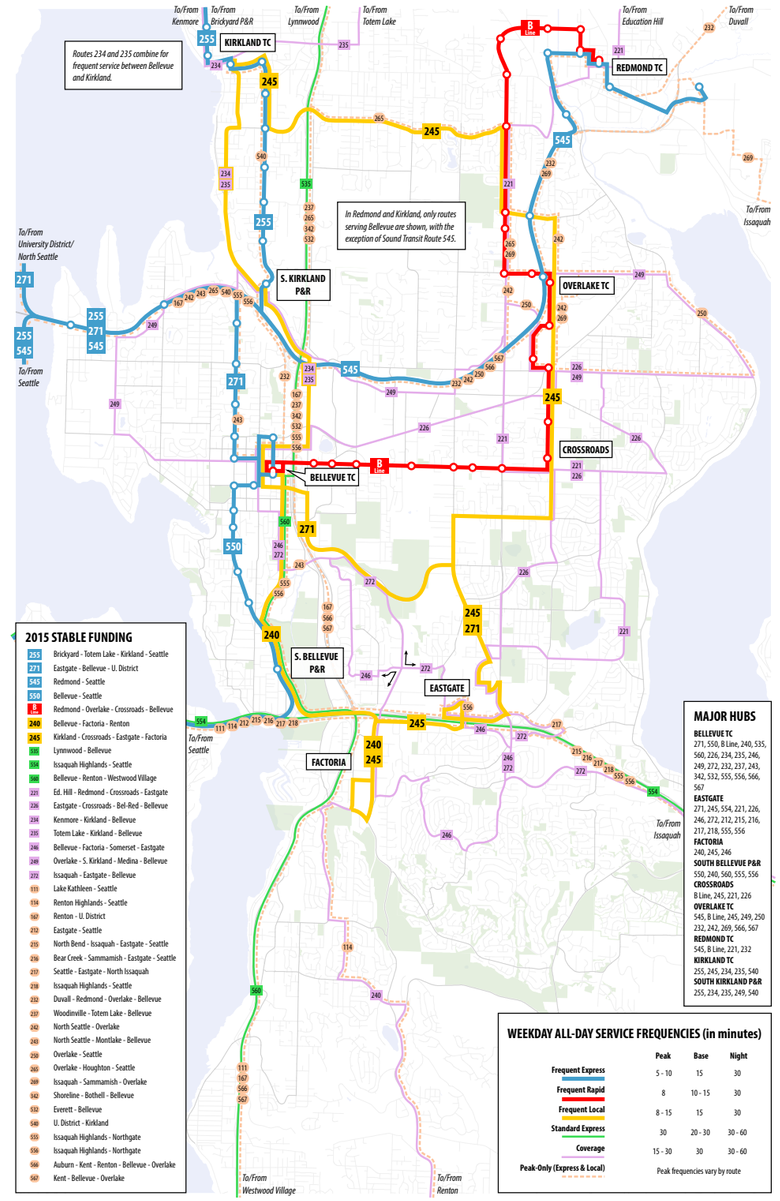
1 Proposition 1 would have also established a low-income vehicle fee rebate of $20 and provided funding for a low-income Metro transit fare.

Draft

2015 | Growing Resources



2015 | Stable Funding



2015 | Reduced Funding

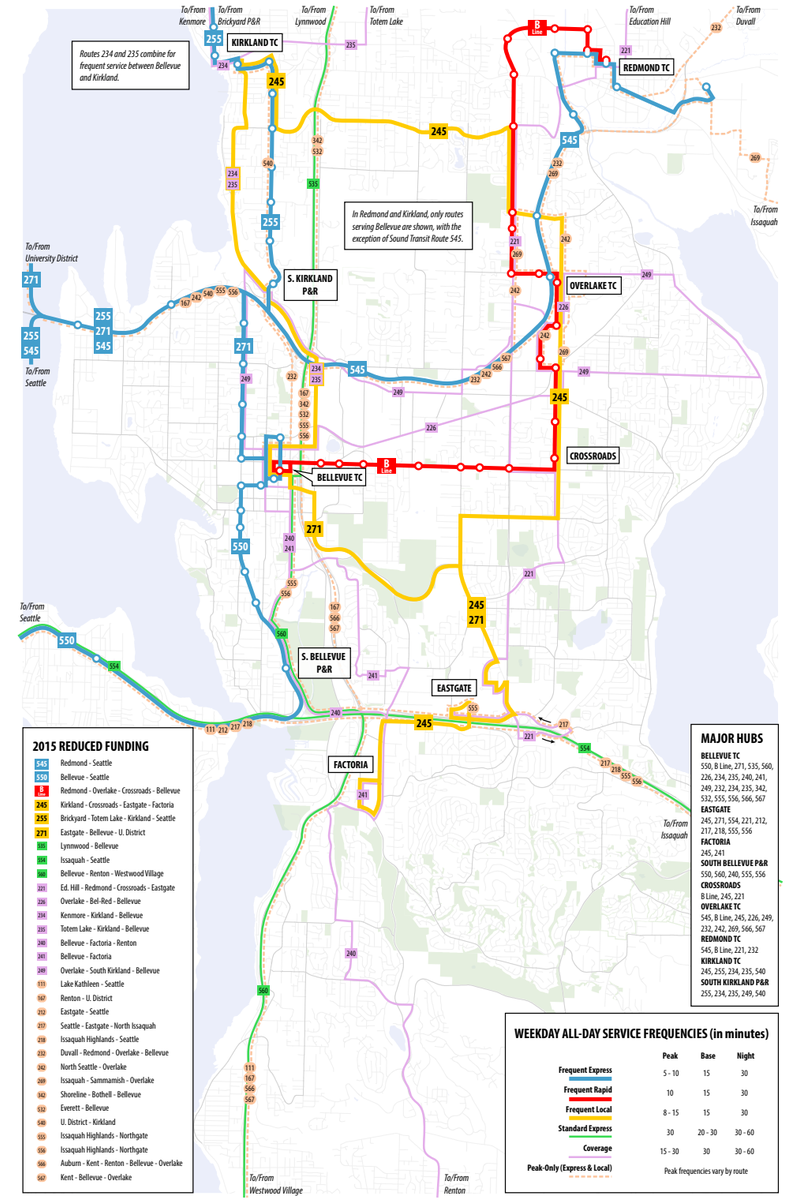


Figure 78 2015 Proposed Network Maps. Route-level details are available for each funding scenario in the *Transit Service Vision Report*.

Draft

Unfold for full-size map

2015 Growing Resources

In the 2015 Growing Resources scenario, existing service patterns are largely retained but some opportunities are taken to move the network toward a future in which frequent service connects all of Bellevue's major centers to each other and to the region. The 2015 Growing Resources scenario resembles existing service except for the following improvements.

The key missing link in Bellevue's frequent network is filled with the addition of frequent service between Downtown Bellevue and Factoria, provided by a revised Route 240. This service runs through South Bellevue so that it can also be used for all-day travel between Factoria and Seattle via a connection to Frequent Express 550 at South Bellevue Park-and-Ride. While the existing Route 240 serves Eastgate between Downtown Bellevue and Factoria, this deviation is eliminated in favor of less-circuitous routing. Easy connections to Eastgate and points farther northeast can be provided with timed transfers with Route 245 at Factoria.

Because SR-520 construction will move the Evergreen Point and Yarrow Point Freeway Stations to the center lanes, Route 271's routing is revised to access SR-520 via Bellevue Way NE, which allows for sufficient travel distance for buses to merge to the center lanes. Route 271 has been seprated into two separate routes at Eastgate. Buses on the local infrequent routing from Issaquah proceed into Bellevue as Route 272 via the routing of existing Route 240. The loss of local service in Medina is mitigated by revising the segment of existing Route 249 between South Kirkland Park-and-Ride and Downtown Bellevue. It will replace the deleted Route 271 segment through Medina via SR-520, Yarrow Point, 84th Ave NE, NE 12th St, Lake Washington Blvd NE, NE 1st St, and NE 8th St.

Because of duplication and service overlap of existing Routes 241 and 246 in south Bellevue, both

Draft

routes are combined into a new Route 246, which is designed to provide service to all of the streets that are currently served. The northern terminus of the route in Clyde Hill is also extended farther north to the Yarrow Point Freeway Station, where connections can be made to frequent service on SR-520.

2015 Stable Funding

As noted, this scenario is nearly identical to the Growing Resources scenario. The only differences from the Growing Resources scenario are in the extent of low-ridership coverage service provided. In the Stable Funding Scenario, low-ridership coverage in Enatai and on 100th Ave NW in northwest Bellevue is eliminated, and the simplification of routes through Somerset also reduces some coverage service there.

Both of these are minor reductions in coverage, because other services generally remain within a one-quarter mile walking distance and are never more than one-half mile away.

2015 Reduced Funding

The Reduced Funding scenario envisions a 17 percent decrease in Metro operating resources, consistent with current projections absent a new source of funding. Sound Transit resources remain approximately constant, but the cumulative result is a substantial cut to transit service at a time when transit demand is rising. This scenario will be damaging to so many of the basic interests that transit serves that it requires extraordinarily difficult choices to be made.

In this scenario, the most urgent needs, based on the *Market Based Strategies*, are (i) not to damage long-term growing markets by cutting their service more than necessary because their demand is rising, and (ii) not to betray the promise of transit implied by the city's transit-oriented development, including all the major areas of intensification in the city. Bellevue is already encouraging high-density, mixed use development in certain key corridors. This kind of

Draft

Figure 79 Following the April 22, 2014 voter rejection of the King County Transportation District Proposition 1, Metro is proposing to revise Route 271 off the Bellevue College campus on to 148th Ave NE. The proposal would impact general purpose traffic where buses will stop for transit passengers in-lane at frequent intervals along 148th—a major north-south arterial. For transit patrons, this proposal adds a half-mile walk from the 148th Ave bus stop to the campus, further exacerbating riders' perceptions about the inconvenience of using transit. Furthermore, it would significantly limit access to campus among students and faculty with disabilities. Nearly a third of Bellevue College students ride transit as their primary mode of transportation.

Figure 80 Unlike Route 271, King County Metro is retaining Route 245 service through the Bellevue College campus. Metro's original service reduction proposal would have also shifted Route 245 to the periphery of the campus on to 148th Ave NE.

density requires frequent all-day service to be livable and functional, so cutting all-day frequencies that need to grow in the future undermines the livability and thus the viability of this growth. For this reason, it is recommended that all-day headways in high demand local and regional corridors—the future Frequent Transit Network—be protected.

Instead, two types of cuts should be made relative to the existing system: (i) deleting peak-only routes that operate empty in the counter-flow direction, and (ii) deleting low-performing coverage routes. One-way peak express service is the most expensive kind of service for a transit agency to operate. Therefore, in a manner mostly consistent with Metro recommendations, this scenario eliminates secondary peak services so that peak resources can be devoted to simpler, frequent patterns focused on park-and-rides and transit connections rather than on driving around in lower-density neighborhoods. This scenario assumes that Metro and Sound Transit will continue to acquire and deploy higher capacity buses, but apart from this, the core assumption is that everyone is going to feel considerable pain from these cuts and that cuts to peak express service—because of its high operating cost—are an inevitable area of focus.

Permanently low-ridership coverage service, which exists for reasons other than ridership, must be trimmed in this scenario. Again, this is done where the alternative is to cut services on which the livability of dense mixed-use neighborhoods rely. While these cuts will be controversial and will involve significant impacts on small numbers of people, the alternative is to cut higher-ridership services that affect larger numbers. For this reason, coverage service is eliminated in this scenario in northwest Bellevue (west of Bellevue Way), Somerset, Enatai, and all areas east of 156th Avenue between NE 20th St and I-90. Local service is retained in areas that have somewhat stronger markets or are 'on the way' between major activity centers.

Draft

It is worth noting that in the Reduced scenarios of later years, coverage is cut much further. However, those years also have more restructuring that creates a more distinct separation between low-ridership coverage services and high-ridership services. The current network has many routes that mix these functions, making their service levels harder to set. Though to a lesser extent than later time horizons, the Growing and Stable scenarios in 2015 also improve the separation of functions. In future scenarios, where more restructuring is possible, stronger segments are assigned to FTN lines, allowing coverage elements to be more easily deleted in low-resource scenarios.

It is important to emphasize that the 2015 Reduced Funding scenario is a "share the pain" vision. Few people, if anyone, can be expected to like it. In transit, it is always impossible to share pain (or benefit) exactly equally. Some riders are simply much more expensive to serve than others, so when cutting service while trying to protect as much ridership as possible, cuts tend to fall more heavily on those more expensive-to-serve customers. Again, however, the balance of investments in ridership versus investments in low-ridership coverage is ultimately a value judgment. This scenario, like all the scenarios in this report, proposes a position on that decision based on the *Market Driven Strategies Report*, but other equally valid judgments could be made about the relative importance of coverage versus ridership goals.

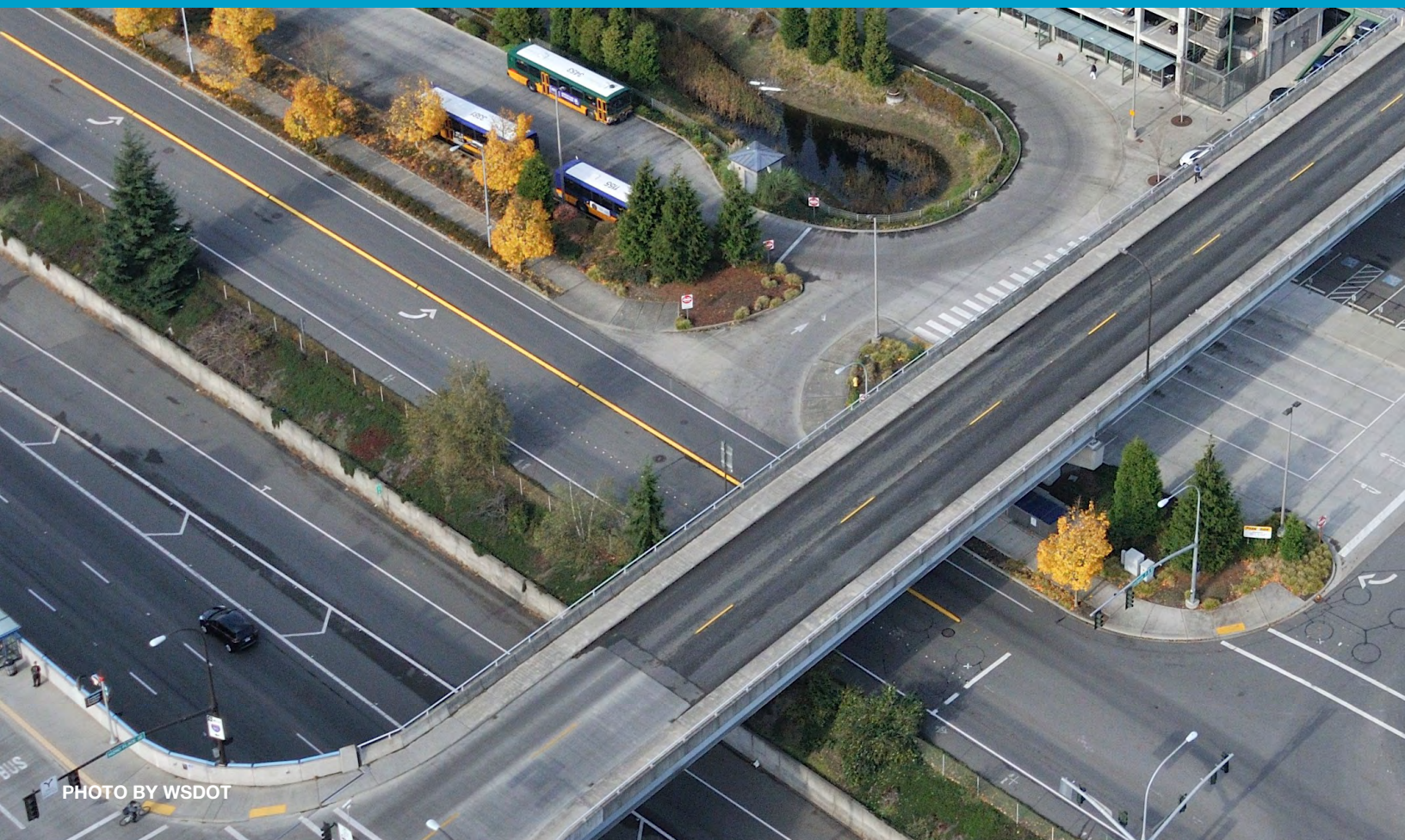


PHOTO BY WSDOT

SECTION 4:

CAPITAL ELEMENT

Draft

CAPITAL VISION

CONTEXT

The Capital Element seeks to address the variety of means through which the City can positively affect the operation and user experience of transit within Bellevue. While the City of Bellevue does not operate its own bus system, it must play a critical role in ensuring that high quality transit is available to keep Bellevue moving. Specifically, the City has the authority to:

- Manage street rights-of-way on which transit operates. By investing in state-of-the-art adaptive traffic signal systems with transit signal priority, Bellevue reduces transit vehicle delay, travel time, and the number of stops on city streets.
- Develop and manage sidewalks and bicycle facilities. By creating accessible communities that seamlessly integrate the pedestrian, bicycle, and transit networks Bellevue increases the market demand for public transportation.
- Set land use policies. By creating vibrant concentrations of retail, office, service, residential, and recreational activity, Bellevue ensures that the greatest possible number of residents and employees have access to high quality transit.
- Use transit as a tool to support the Bellevue Comprehensive Plan. By adopting transit supportive policies, Bellevue has clarified its commitment to public transportation as part of a balanced strategy to improve mobility and meet sustainability and economic development goals.
- Advocate for Bellevue residents and businesses in regional forums. By working with residents and businesses to identify the City's transit needs, Bellevue has been successful in identifying and attracting new transit investments.

Draft

The Capital Vision addresses four topics based on the areas over which the City of Bellevue has influence on the attractiveness and performance of transit services locally. This includes influencing demand for transit by co-locating appropriate land uses to transit services, connecting pedestrians and bicyclists to the transit network, providing convenient, safe, and comfortable transit stops, and maintaining roadways, traffic signals, and other infrastructure that supports efficient and reliable operations. All aspects of the transit trip should be designed around the rider. These topics are organized in terms of both increasing specificity to transit operations and in the same order that they are experienced by transit users from the beginning of a transit trip. The following pages provide a brief review of each of the major issues addressed in each of the topics listed at right and shown in Figure 81 below. For additional information about each of these topics, refer to the Transit Capital Vision Report.

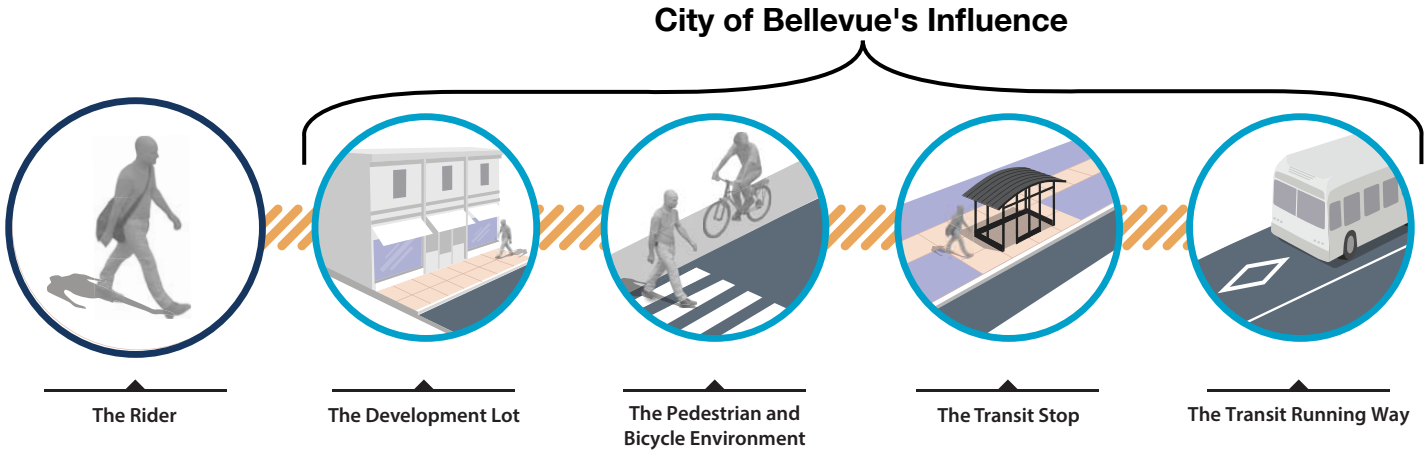
The Development Lot is where all transit trips begin. This section addresses the relationship between land use and transit services.

The Pedestrian and Bicycle Environment serves as the primary link between transit users' points of origin and transit services. More direct connections and hospitable facilities encourage greater use of transit.

The Transit Stop is the first point of contact between the passenger and the transit service. This is where pedestrians, bicyclists, and park-and-ride users transition from their mode of access to transit users.

The Transit Running Way encompasses the street rights-of-way on which transit services operate. While transit service providers define routes and schedules and operate the vehicles, the city builds and maintains roadway and traffic signal infrastructure, which significantly impact the speed and reliability of transit services.

Figure 81 Areas related to transit capital facilities over which the City of Bellevue has influence.

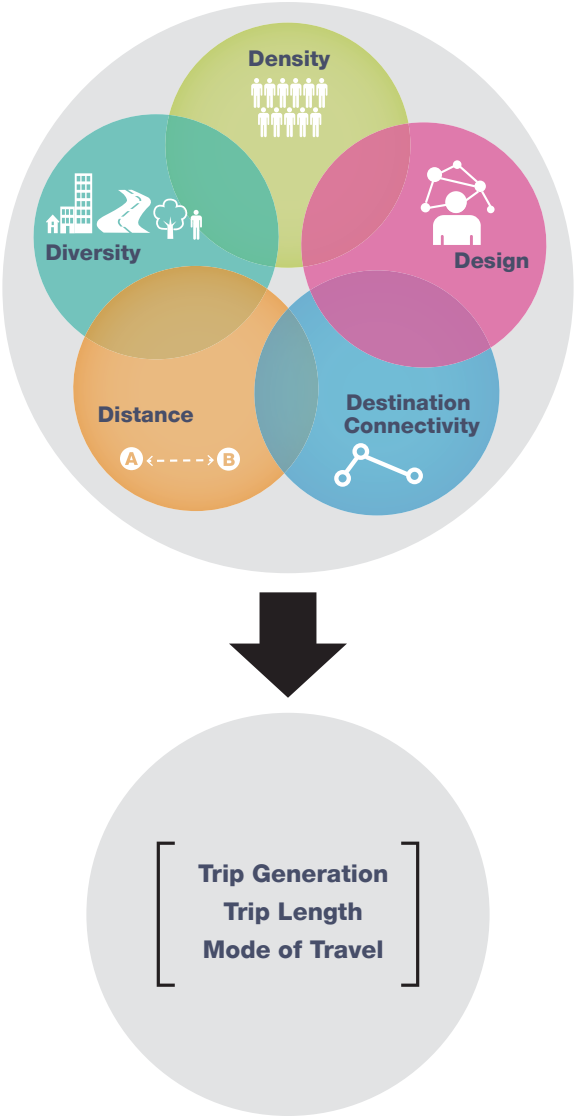


Draft

"Better [integrate] land use and transportation, so that people have more choices in how they move around. This will require better pedestrian linkages for new and existing developments, and a density and mix of land uses that encourage walking and transit in appropriate locations."

- Land Use Element, *City of Bellevue Comprehensive Plan (2004: 35)*

Figure 82 The "5 Ds" of the built environment that can encourage mode shift from single-occupant vehicles (SOVs) to alternatives like public transit.



THE DEVELOPMENT LOT

The Five Ds of the built environment—*density*, land use *diversity*, pedestrian-oriented *design*, *destination* accessibility and connectivity, and *distance* to transit—are commonly cited as the built environment factors that can encourage mode shift from single-occupant vehicles (SOVs) to public transportation, walking, and bicycling. The development lot represents both the origin and destination of every transit trip and relates to the first three Ds. The development lot includes parcels of private property (e.g. housing, offices, commercial services) and public places (e.g. schools, community centers, parks). The density, diversity, and design of these places are influenced by the zoning and subdivision regulations designated in the Comprehensive Plan.

Bellevue is a city with substantial variety in land uses, development types, and urban form. Factors that differentiate development types include urban structure (the spatial layout of a city), density (in terms of residential and employment), and design (site configuration and the dimensions and design of elements in the public realm). All of these factors affect the performance of transit in a community. The city's diverse neighborhoods have developed over a period of many decades, each reflecting the prevailing trends and consumer preferences of their time. Residential areas range from low-density single-family subdivisions and equestrian lots to mid- and high-rise apartments and condominiums. Emplyoment centers have developed in several parts of the city, ranging from auto-oriented retail and office park developments with large surface parking lots and building setbacks to the dense, mixed-use, increasingly walkable Downtown core.

Although the character of many areas will generally remain as they are today, particularly Bellevue's established single-family residential neighborhoods, other areas will realize significant changes in the

Draft

coming years. Bellevue's Comprehensive Plan—currently undergoing its decennial update—notes that a mix of employment and residential uses will continue to concentrate in Downtown, one of the major urban centers in King County. As the city center continues to grow, providing people with more transportation choices will be a key to realizing the viable, livable, memorable Downtown with a strong and diverse economy that the plan envisions. Additionally, the Bel-Red area, historically the city's warehouse and manufacturing district, is transitioning into an area of mid-rise mixed-use office, retail, and residential land uses, coinciding with the extension of Sound Transit's regional light rail network through the area.

While it is neither necessary nor recommended that all places look and function the same, it is important to recognize that some fundamental characteristics of urban form and site design increase the likelihood that an area will support access

Figure 83 Bellevue is characterized by a wide variety of land use types, ranging from single-family residential neighborhoods to the dense, mixed-use Downtown core.

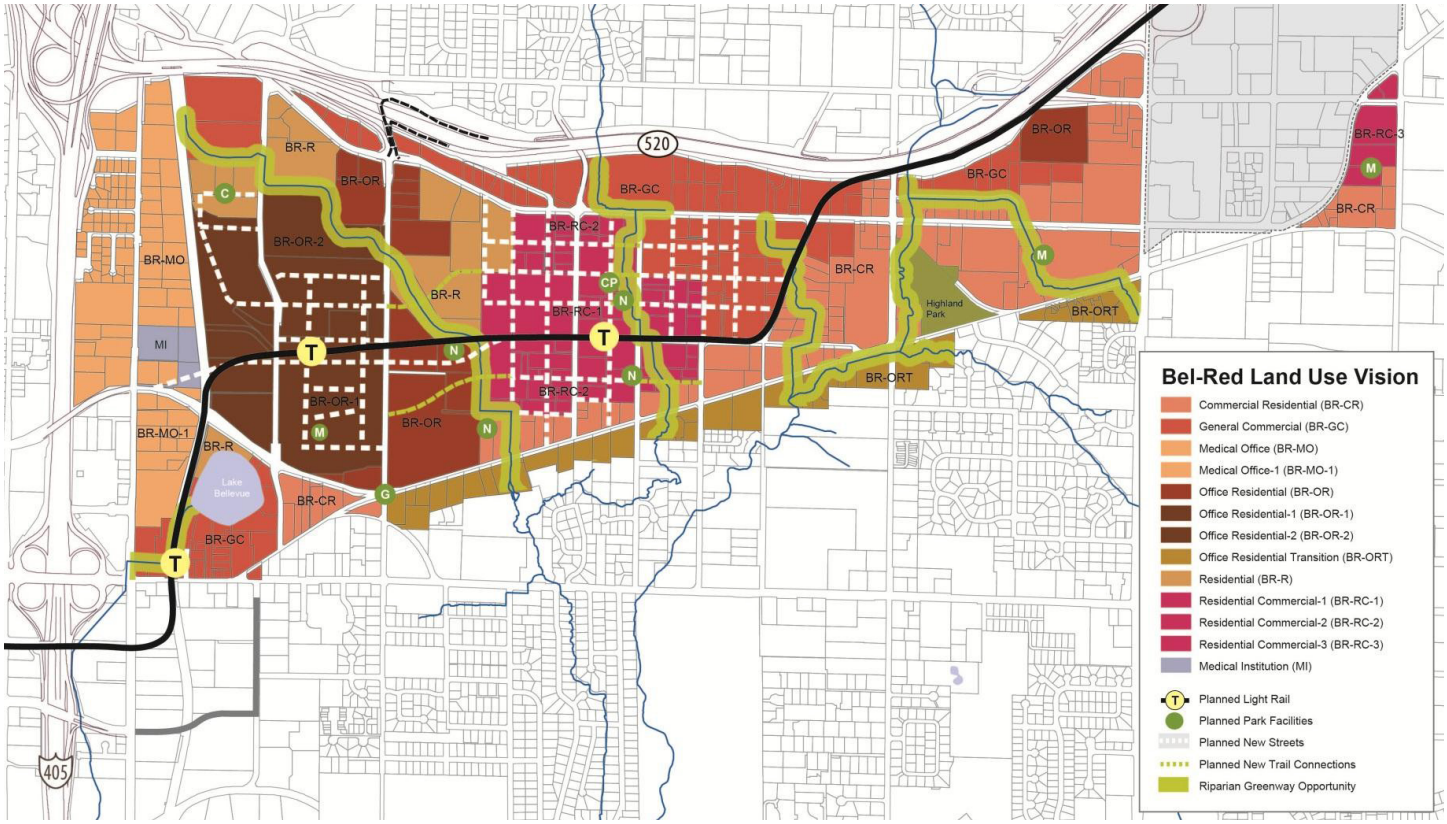
IMAGERY FROM Bing Maps

Draft

to and the operation of transit. The Transit Master Plan "Abundant Access" vision statement aims to provide "efficient, useful, attractive service for the most people, to most destinations, most of the time, serving maximum ridership." Thus, while coverage services will be provided to the extent possible with available resources, when trade-offs are required, places that foster productive service are prioritized. For additional information about the service-oriented strategies and future transit networks proposed by the Transit Master Plan, refer to the *Market-Driven Strategies Report* and *Transit Service Vision Report*.

Looking to the future, between 2010 and 2030 the City of Bellevue as a whole is expected to increase in population by over 28,000. Downtown is expected to accommodate about 45 percent of this projected growth, Bel-Red will accommodate almost another third of projected growth, and other mixed use areas about 16 percent. The number of jobs in Bellevue is expected to increase by over 54,000 between 2010 and 2030. Downtown Bellevue is projected to capture over half of these jobs, Bel-Red about 18

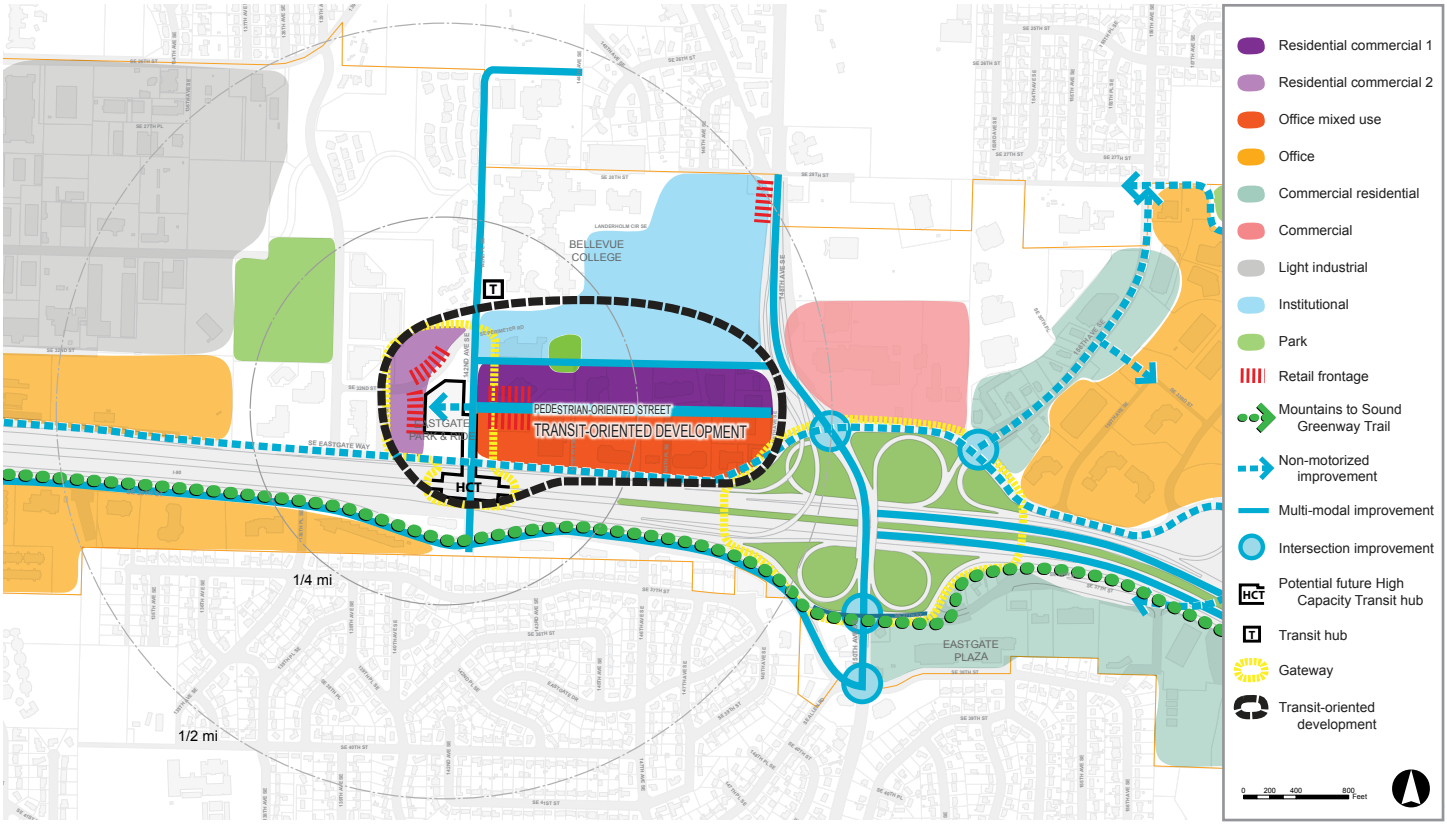
Figure 84 Artist rendering of the future Bel-Red area—a transit-oriented, mixed-use neighborhood following the introduction of East Link light rail in 2023.



percent, and Eastgate almost 14 percent. Other commercial and industrial lands in the city will capture the remaining 12 percent of projected job growth. Focusing growth and development around these major transit stops allows more people to live near transit services, and makes more destinations accessible by transit.

To support this growth, it will be critical to integrate the provision of enhanced transit supply with a supportive land use mix, together with enhanced transit passenger and walking amenities, as well as transit supportive infrastructure. There are a number of promising trends that suggest the continued improvement of transit as a viable mobility option for Bellevue residents.

Figure 85 The Bellevue College Connection Multimodal Transportation Corridor (Project L27) will contribute to the integration of a balanced transportation system in Eastgate that emphasizes transit and non-motorized connectivity with Bellevue College and a cluster of mixed-use residential, retail, and office buildings around a new pedestrian-friendly "main street" envisioned east of the park-and-ride, creating a vibrant urban neighborhood where people can live, work, shop, learn, and recreate. The map below is an excerpt from the Eastgate/I-90 Land Use and Transportation Report.



Draft

THE PEDESTRIAN AND BICYCLE ENVIRONMENT

Figure 86 The SE 28th Pl stairs to 112th Ave NE dramatically reduce the network-based walking distance to the South Bellevue Park-and-Ride for portions of the Enatai neighborhood.

A transit system involves the superimposition of two networks: the access network, used by people to reach the system, and the service network provided by bus operators, with the bus stop serving as the point of connection between the two. All transit users are pedestrians for some part of their trip, so the provision of an accessible pedestrian network is an essential component of a useful transit system. If potential transit users are unable to reach a bus stop easily, quickly, and reasonably directly, they are more likely to consider alternative travel modes if any are available to them.

A preliminarily assessment of access to the 2030 transit networks is provided by Figure 87. White areas on the maps are within one radial quarter-mile of a transit stop served by one or more FTN or Coverage routes in 2030.[1] Because population and job growth is anticipated primarily within Bellevue's mixed-use centers, all of the 2030 networks are expected to provide access to transit for larger shares of Bellevue's residents and jobs than enjoyed access in 2012.[2] For example, whereas 63 percent of jobs were within one radial quarter-mile of 15-minute transit service during the AM peak in 2012, 82 percent will have such access in 2030 regardless of funding scenario. Likewise, all funding scenarios will result in larger shares of households with access to 15-minute service in 2030 (approximately 58 percent for each) than in 2012 (42 percent). However, as shown in Table 3, access to 30-minute service is diminished in the Stable and Reduced Funding scenarios, corresponding to the reduction and elimination of Coverage service in these networks.

1 The *Transit Service Vision Report* also presents access maps reflecting half-mile radii around FTN and Coverage service bus stops. Although further than many riders who choose to use transit may be willing to walk, a half-mile remains a reasonable service distance to provide for those who depend on transit for some or all of their personal mobility needs.

2 Refer to the *Existing and Future Conditions Report* for additional information about access to the 2012 transit network.

The Transit Master Plan considers existing pedestrian and bicycle projects proposed by other planning efforts and identifies which may specifically improve non-motorized access to transit. No new pedestrian or bicycle projects are proposed.[3] The assessment completed to date represents only an initial screening of the projects identified by the *2009 Pedestrian and Bicycle Transportation Plan Report* and the *Eastgate/I-90 Transportation Strategies Report*. Any project that has some portion within one quarter-mile of an FTN bus stop is identified as a priority for transit at this stage (see Figure 89).

The basic assessment summarized here does not assign any priority ranking to a project for which this has not already been done. The 2009 Ped-Bike Plan assigns priorities of high, medium, and low based on a variety of criteria, one of which is quarter-mile proximity to and stop-level ridership at a bus stop. However, transit considerations were only one part

3 Two existing 2009 Ped-Bike Plan projects (S-464 and B-146) are modified to reflect the concepts identified by Running Way Project L27, the 142nd Pl SE/Snoqualmie River Rd Multimodal Transportation Corridor. Refer to Appendix B1 of the Transit Capital Vision Report for details.

Table 3 Forecast (2030) populations in Bellevue within one-quarter and one-half mile radial areas of transit stops served by routes operating 15- and 30-minute frequencies.

Funding Scenario	2030 Employment Projection				Total Jobs
	Quarter-Mile		Half-Mile		
	15-min	30-min	15-min	30-min	
Growing	82.2%	93.3%	95.2%	98.6%	184,300
Stable	82.2%	89.8%	95.2%	97.2%	
Reduced	82.2%	82.2%	95.2%	95.2%	

Funding Scenario	2030 Households Projection				Total HH
	Quarter-Mile		Half-Mile		
	15-min	30-min	15-min	30-min	
Growing	58.1%	76.6%	75.4%	91.3%	70,300
Stable	57.7%	68.5%	75.3%	85.4%	
Reduced	57.8%	57.8%	75.3%	75.5%	

Funding Scenario	2030 Population Projection				Total Pop
	Quarter-Mile		Half-Mile		
	15-min	30-min	15-min	30-min	
Growing	51.2%	72.6%	69.9%	89.3%	157,400
Stable	50.9%	63.2%	69.8%	82.1%	
Reduced	50.9%	51.0%	69.8%	70.0%	

Figure 87 Access to transit in Bellevue within one-quarter mile of 30-minute or better service on weekdays in 2030.

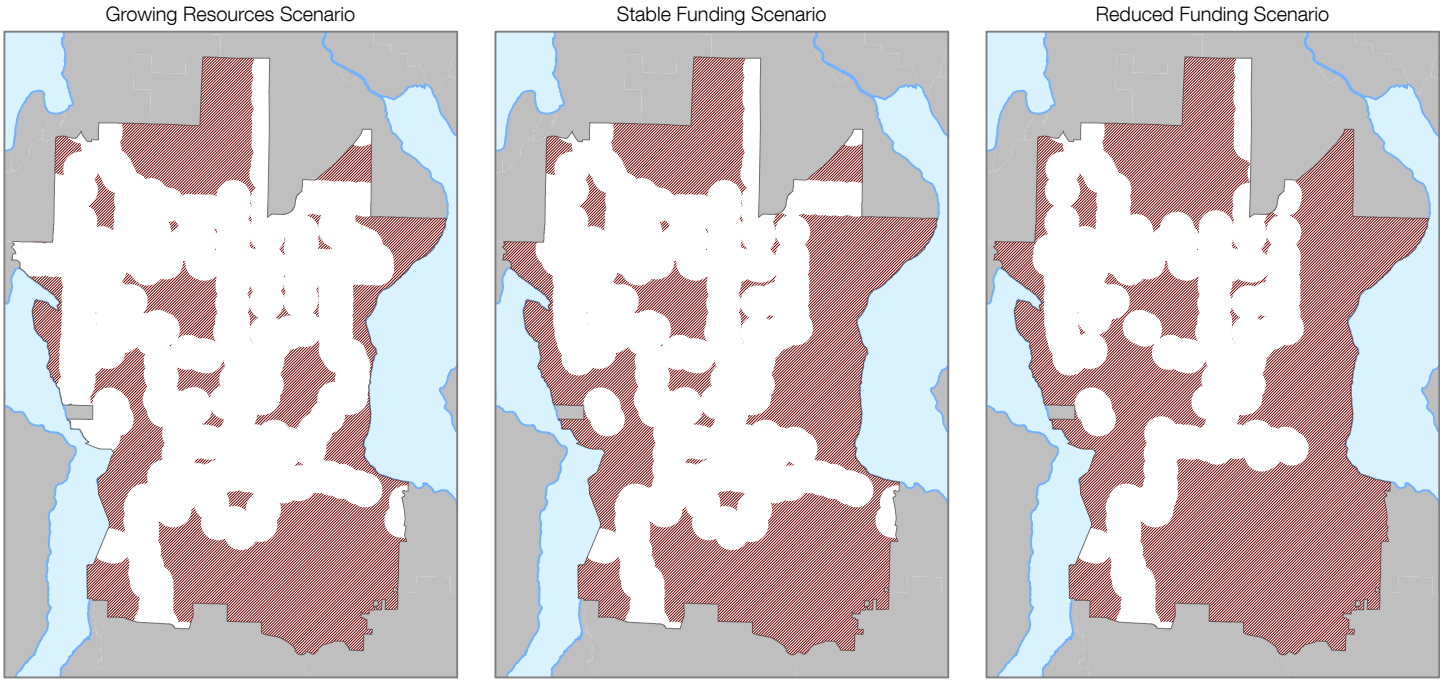


Figure 88 Existing non-motorized transportation facility types, as identified by the *2009 Pedestrian and Bicycle Transportation Plan Report.*

Table 4 Preliminary screening of transit priority pedestrian and bicycle projects.

Project Type	High Priority*		Total Transit Priority Projects	
Sidewalk Projects	89	57.8%	**154**	**45.0%**
Bicycle Projects	48	40.7%	**118**	**34.5%**
Offstreet Path Projects	11	29.7%	**37**	**10.8%**
Trail Projects	18	62.1%	**29**	**8.5%**
Multimodal Intersections	0	0.0%	**4**	**1.2%**
All Projects	166	48.5%	**342**	

Note: Percentages in the center column reflect the number of each project type rated as High Priority. Percentages in the right column reflect the number of total projects of each type.

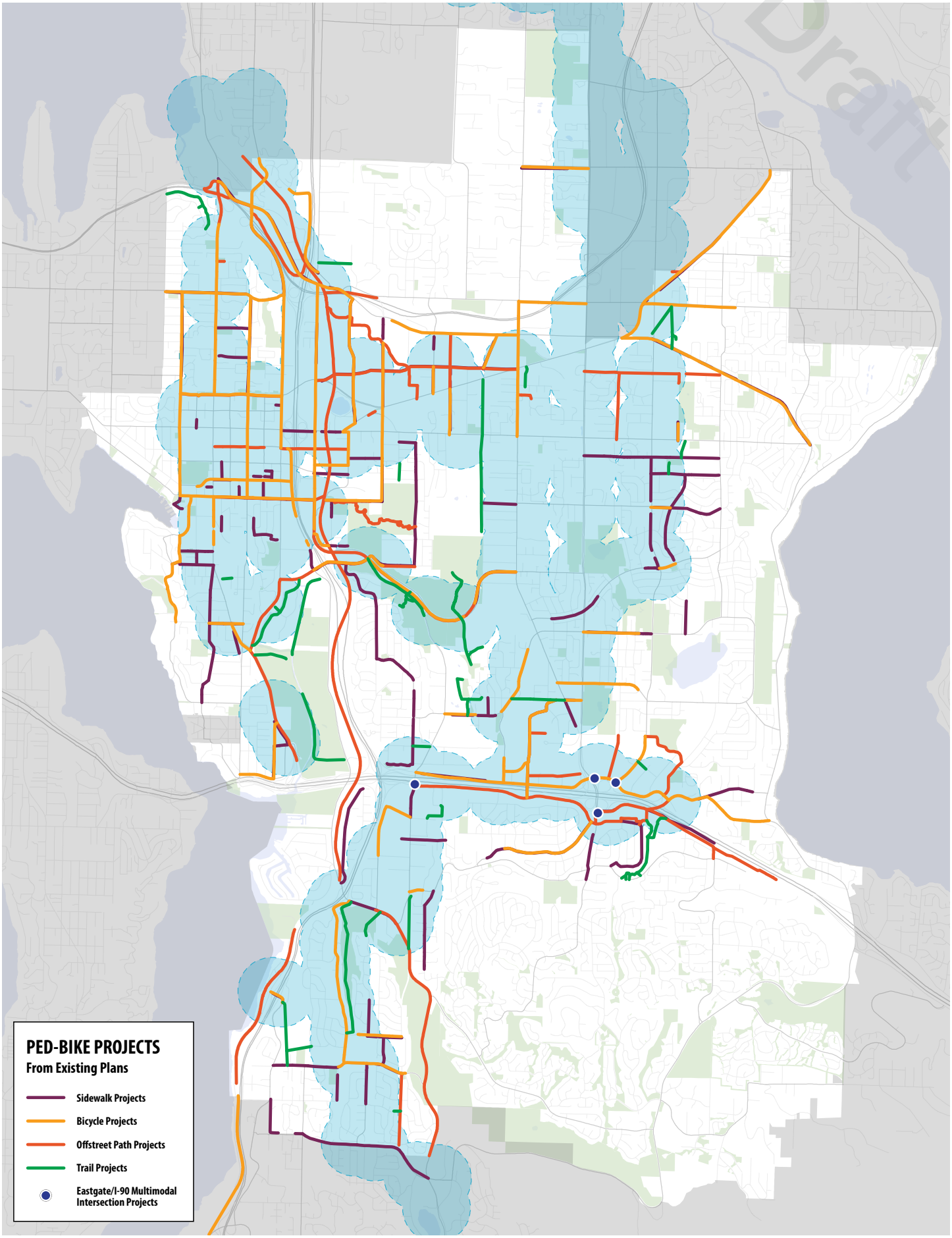
*Projects rated High Priority by the 2009 Pedestrian-Bicycle Plan project prioritization process.

of the overall prioritization scheme used in the 2009 Ped-Bike Plan, as the emphasis of that plan was not on transit. For the purposes of this preliminary screening of transit priority pedestrian and bicycle projects, these priority rankings are considered and reported, but the more rigorous access analysis currently underway will assign new, transit-centric priority rankings according to other metrics. The Eastgate/I-90 Plan did not assign priority rankings to any of the projects that it identifies.

As shown in Table 4, a total of 342 projects are identified as being transit priority non-motorized projects. Nearly half of these are sidewalk projects, of which nearly 60 percent are considered High Priority by the 2009 Ped-Bike Plan. Of the various project types, sidewalk projects are generally the most evenly distributed throughout the city. Bicycle facilities and offstreet paths are somewhat less evenly dispersed throughout the city, with a particular abundance clearly identifiable in and around Downtown and Bel-Red. This is consistent with the more diffuse structure of the future bicycle network, except for the denser grids in these urban centers.

A more detailed analysis of access to transit is currently underway, which considers factors including network-based distance, travel time, route directness, and terrain grade. These factors will be used to assess the degree to which transit is accessible given current pedestrian and bicycle infrastructure and the degree to which access would be improved by transit-priority non-motorized transportation projects. This ongoing analysis will provide a quantitative assessment of how easily people beginning at any given property in the city can reach their nearest transit stop, benefitting the implementation of the Transit Master Plan, future updates of the Pedestrian and Bicycle Plan, and evaluation of the relationship between proposed route structures and land use designations.

Figure 89 Preliminary transit priority pedestrian and bicycle projects.



Draft

THE TRANSIT STOP

The transit stop is the first point of interaction between the transit user and the transit system. The efficient placement of bus stops near major destinations with well-connected pedestrian and bicycle facilities helps to provide communities with viable transportation choices by making the entire transit trip shorter and more pleasant. Also important to the ability of transit to attract ridership is the quality and comfort of the transit stop and its environment.

The Transit Master Plan (TMP) does not make specific recommendations about bus stop locations for the route networks being proposed beyond the general stop spacing guidelines identified for the various service types. Instead, this section focuses on three other subjects related to the transit stop: bus stop amenities, commuter parking, and bus layover needs. The first two of these subjects relate primarily to how transit users experience their first point of contact with the transit system, while the third deals with operational considerations.

Figure 91 Transit use patterns in Bellevue based on Fall 2011 boarding and alighting (on/off) data.

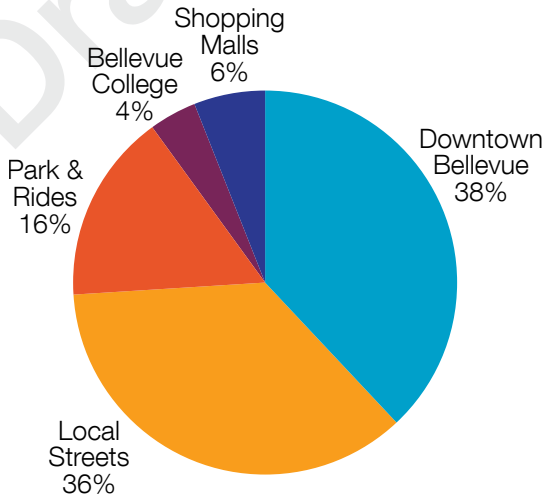
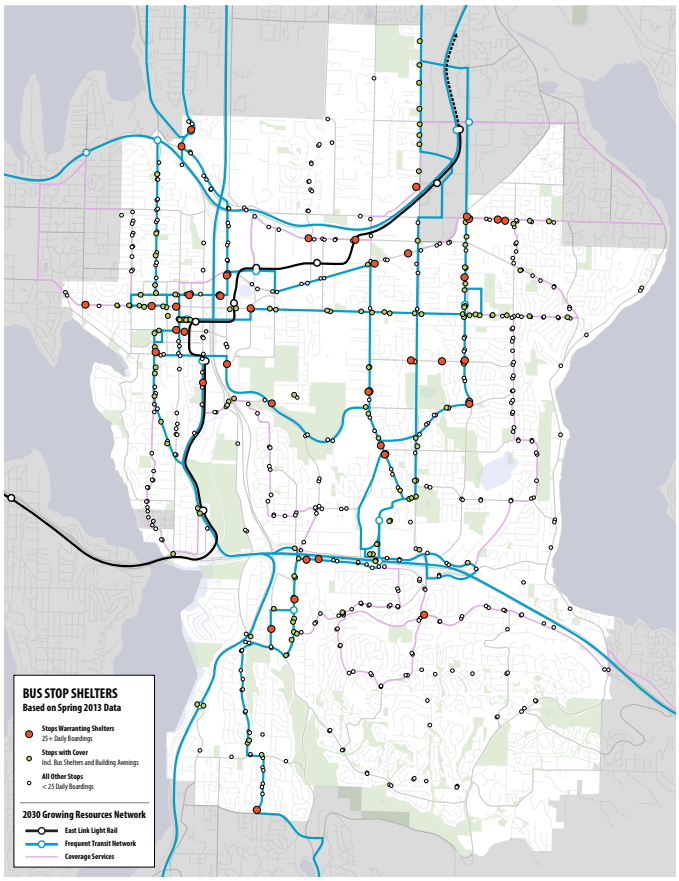


Figure 92 Bus stops warranting shelters based on Spring 2013 stop-level boardings and alightings (ons/offs).



Bus Stop Amenities

Bus Shelters

As of Fall 2011, 84 percent of boardings and alightings in Bellevue took place outside of park-and-ride lots, with 36 percent at bus stops on local streets (see Figure 91). Waiting area amenities increase the convenience, comfort, safety, and usefulness of bus stops and influence the overall attractiveness of public transportation. Stop locations that are designed with paved waiting pads, shelters, benches, lighting, windbreaks, route information, trash bins, bicycle racks, and, in some cases, off-board pay stations and real-time arrival information make bus stops more hospitable places to be. The most fundamental of the various bus stop amenities is the bus shelter, which provides protection from the

elements and seating. Several factors influence the determination of need for various stop amenities. For stop shelters, the primary consideration is stop-level passenger activity. King County Metro's bus shelter warrant standard requires shelters to be installed at stops with 25 or more average daily boardings. Forty-three stops serve sufficient daily boardings to warrant a stop shelter but currently have no form of cover provided, as shown in Figure 92.

Other factors may also warrant installation of a bus shelter in the absense of high ridership. For example, stops with nearby healthcare facilities or services oriented toward older adults, rapidly growing areas, or areas that are particularly vulnerable to the elements, such as highway overpasses may indicate a need for targeted investment to improve passenger comfort and encourage additional transit use.

Schedule Information

When asked how the City should invest municipal resources to improve transit in Bellevue, 21 percent indicated that real-time bus arrival information should be provided at major stops, similar to that available at RapidRide B Line stations. Although King County Metro currently has no plans to implement this feature more broadly at standard bus stops throughout its service network, precedent exists for municipalities to pursue such investments on their own. For example, the Seattle Department of Transportation has installed digital monitors in downtown storefront windows adjacent to several high passenger activity bus stops that display real-time arrival data for all routes serving those stops (see Figure 95). Given sufficient community interest, available resources, and willing business property owners adjacent to transit stops, the opportunity exists for the City of Bellevue to consider pursuing such investments at costs many times less than most other transit infrastructure improvements.

PHOTO BY Ned Ahrens

Figure 93 Stops served by RapidRide lines are distinguished from other services by the style and amenities at stations.

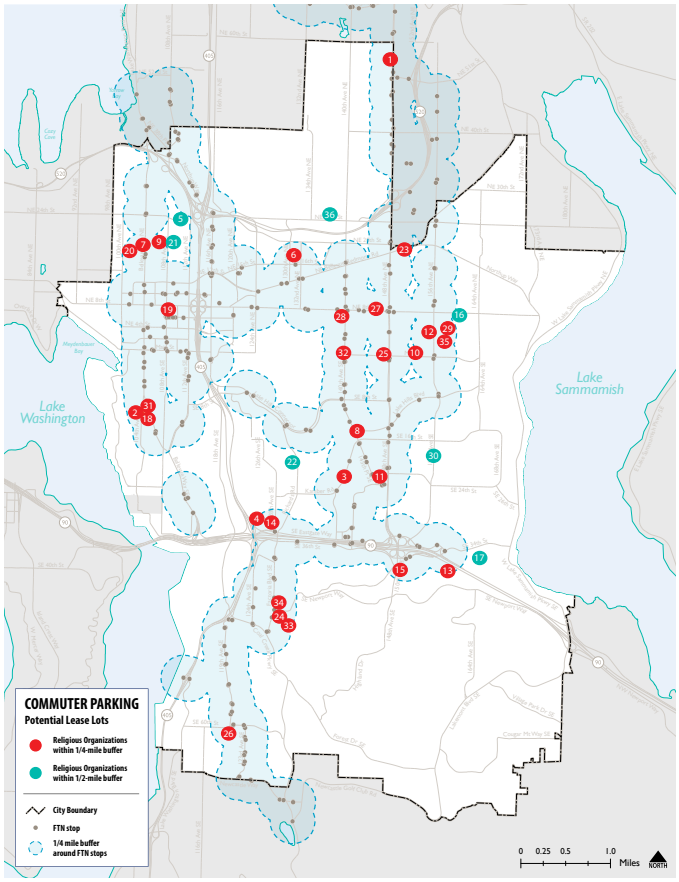
Figure 94 A covered pedestrian walkway at the Totem Lake Freeway Station on I-405 in Kirkland. Similar improvements are envisioned for the Eastgate Park-and-Ride and Freeway Station.

PHOTO BY Oran Viriyincy

Figure 95 A digital signboard in Downtown Seattle, funded and installed bty the Seattle DOT, displaying real-time arrival information from OneBusAway.

Figure 97 The South Bellevue Park-and-Ride is often over capacity, with many vehicles parked along the shoulders of the driveway (circled).

Figure 98 Potential lease lots within one-quarter and one-half mile radial catchment areas of 2030 Frequent Transit Network stops.



Commuter Parking

Commuter parking facilities play an important role in concentrating transit rider demand, often in lower-density areas that would otherwise be unable to support frequent services. These facilities provide convenient access to transit via automobile or bicycle for people who do not live within convenient walking distance of a standard bus stop. By supporting the use of alternatives to the single-occupant vehicle, park-and-rides help to reduce the need for increasing roadway capacity as the region grows. Further, by concentrating transit boardings at a single point, a more frequent level of service can be supported.

Park-and-ride usage in the Puget Sound region over the past ten years can be summarized by two trends. First, there is an uneven regional distribution of park-and-ride use. Several lots east of Bellevue and/or an inconvenient distance from the FTN are under-capacity, while several lots in western Bellevue such as the South Bellevue Park-and-Ride are over-capacity. This imbalance indicates that lot location in relationship to the FTN is an important factor to consider when siting new facilities. Second, there is a trend of increasing utilization of park-and-ride lots overall, with the two study corridors reflecting a 63 percent increase between 2000 and 2013.

A review of 2030 projected commuter parking demand for the I-405 and I-90 corridors, considersed in light of existing parking facilities, determined that there would be an undersupply of parking stalls available along these corridors if the 2030 Growing Resource network is implemented as proposed. If an unlimited supply of parking were available along each of the corridors, the I-90 and I-405 corridors would be short by approximately 6,300 and 4,600 stalls, respectively. Unconstrained demand is approximately 200 percent greater than constrained demand, suggesting that new riders will likely begin using the system given increased parking availability.

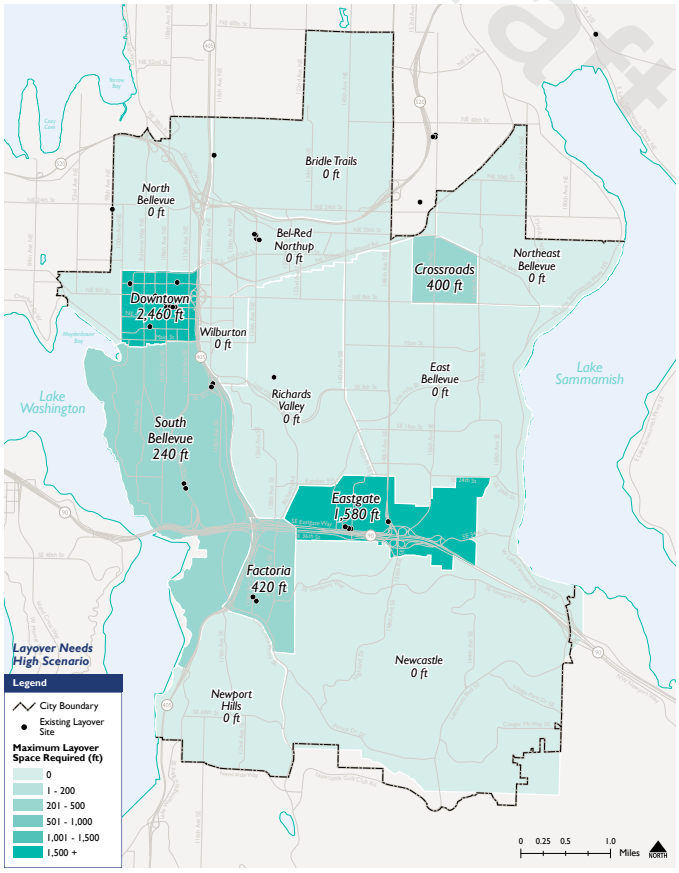
Leased lots—shared use park-and-ride lots—are offer a means to better serve low-density residential areas. If all churches within a quarter-mile walking distance of the FTN were to share their parking, more than 3,500 stalls would become available. Figure 98 provides a reference map showing the twenty-five church locations that fall within a quarter-mile radius of FTN stops, as well as the seven additional churches that are within a half mile walking distance.

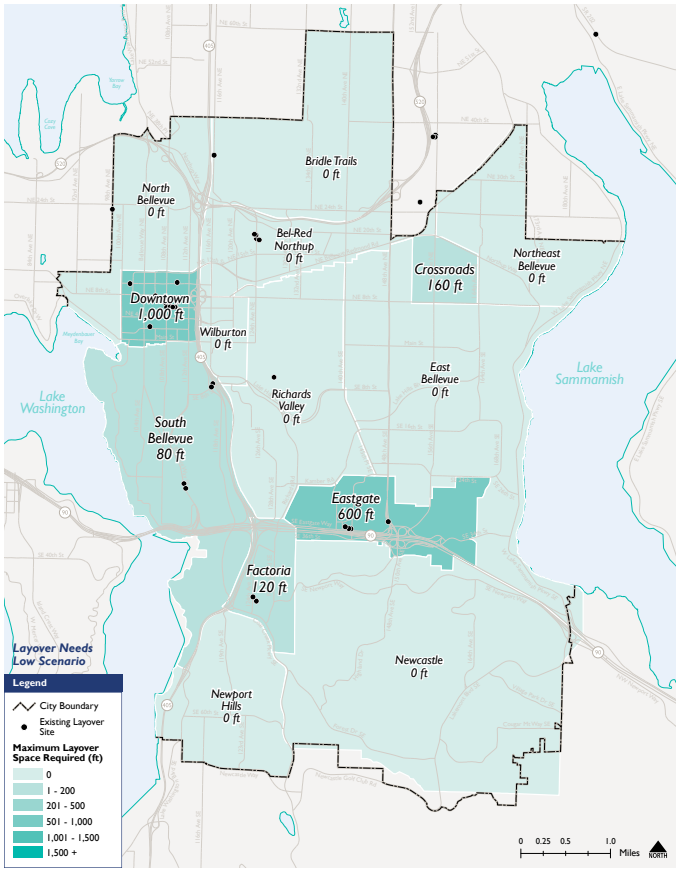
Bus Layover Needs

The layover, or amount of time between the end of one trip and the start of the next trip, requires that space be provided at transit facilities or designated along nearby streets or parking lots for transit vehicles to park while not in service. Inefficiencies result when vehicles must travel from their route terminal to reach the layover location. Understanding how much layover space will be required and where that space can most efficiently be accommodated can help to ensure that the scarce regional transit resources allocated to Bellevue are used to provide service to passengers, not lost to operational inefficiencies.

It is estimated that the maximum layover space required for the 2030 Growing Resources network will range from 3,560 to 8,480 feet, depending on the assumptions made. The two maps in Figure 99 depict the high and low layover need estimates by Mobility Management Area (MMA). It is estimated that approximately 7,000 feet of layover space currently exist in the study area that includes Bellevue and portions of other Eastside communities. While this total might be sufficient to accommodate the projected needs in aggregate, future proposed routes have different terminals than existing routes, so additional analysis will be required in the coming years to determine where these needs can be optimally accommodated.

Figure 99 Bus layover needs in linear feet by Mobility Management Area (MMA): low estimate (top) and high estimate (bottom).





Draft

Draft

TRANSIT RUNNING WAY

The Capital Vision identifies a total of 107 capital projects that would benefit transit speed and reliability. As shown in Table 5, these include 19 running way improvement projects, 39 spot improvement projects, 5 tracking and additional study projects, and 44 near-term transit signal priority (TSP) projects.

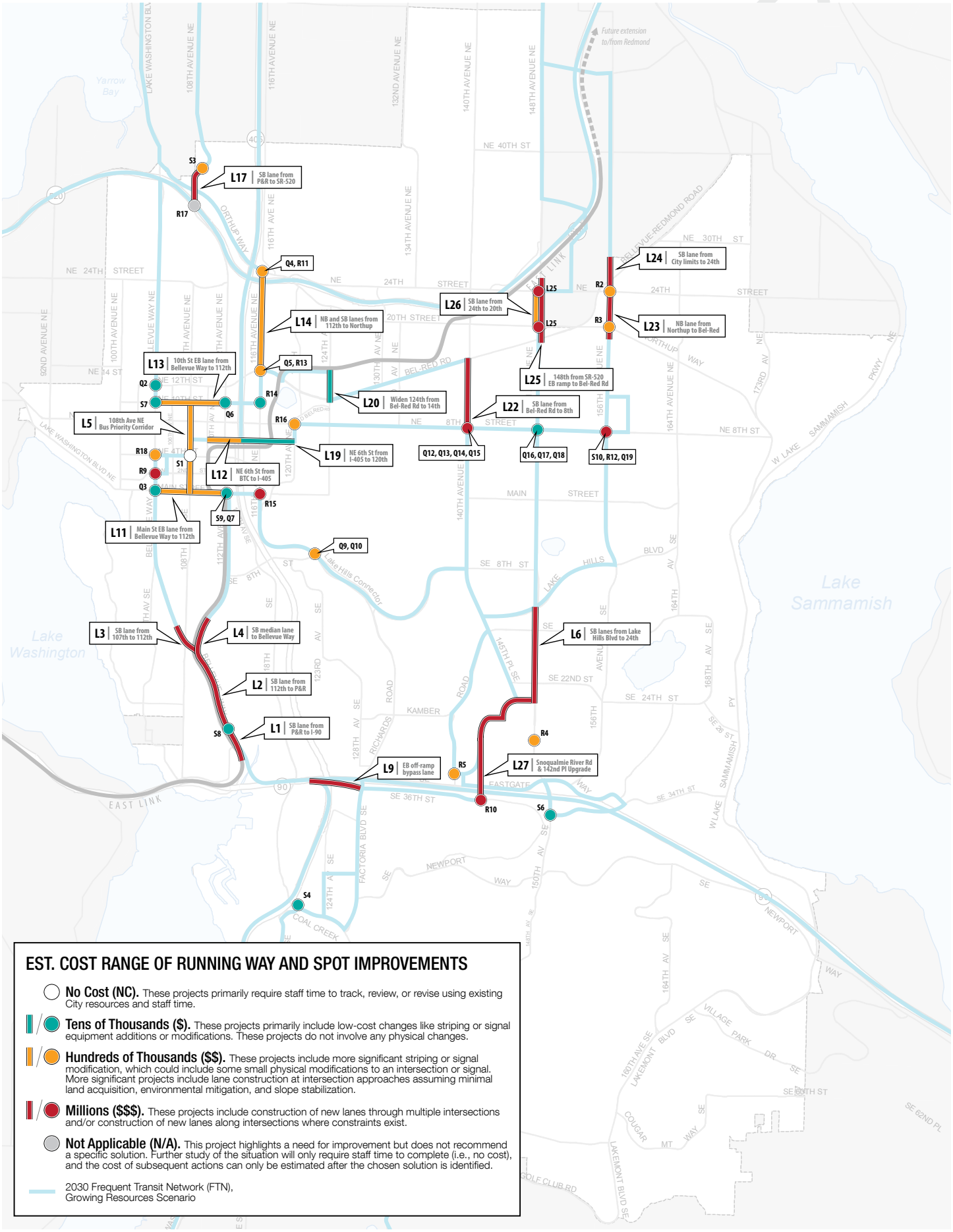
These include some existing projects already adopted in the Transportation Facility Plan (TFP) and/or Transportation Improvement Program (TIP), previously proposed projects from past planning efforts (e.g. Eastgate/I-90 Land Use and Transportation Project, Downtown Transportation Plan Update), and numerous new projects conceived during the TMP Capital Element planning process. New projects were advanced through a multi-stage process that began with the development of a transit priority toolbox, was followed by a geographic information system- (GIS-) based issue identification analysis, and ultimately proceeded through several iterations of project feasibility screening. Travel demand modeling was used to provide some inputs into the issue identification analysis, and both travel demand and micro-simulation models were used to help assess the potential degree of benefit provided by certain subsets of the total project list.

General cost estimates were identified for each project; Figure 100 maps the location and estimated costs of all running way and spot improvement projects, as well as two location-specific tracking projects. Citywide tracking projects and TSP projects are not included in the map, the latter because they are too numerous to include in a single map together with the others.

Table 5 Summary of speed and reliability projects by type.

Project Type	No. of Projects
Running Way Improvements	19
HOV Lanes	8
BAT Lanes	6
Roadway Construction	5
Spot Improvements	39
Queue Jump Lanes	16
Intersection and Roadway Improvements	13
Signalization Improvements	10
TSP Projects (Near-term)	44
Tracking & Additional Study	5
Total	107

Figure 100 Transit running way and spot improvement projects by estimated cost range.



Draft

Project Prioritization

The Transportation Commission assigned priorities were assigned to each of the running way, spot improvement, and location-specific tracking projects presented in this report. The results of this priorization are mapped in Figure 102. For a more thorough explanation of the project prioritization process, refer to the Running Way section of the Transit Capital Vision Report.

The purpose of prioritizing the proposed capital projects is to maximize the value to the Frequent Transit Network (FTN). Thus, the FTN's long-term composite scores serve as the primary means of identifying a project's priority. These initial priority assignments were then refined according to three separate considerations: (1) the existing inclusion of a proposed project in the Transportation Facilties

Figure 101 Running Way Improvement Project L1: A southbound median HOV lane will be constructed on Bellevue Way SE between the South Bellevue Park-and-Ride and I-90 by Sound Transit as part of the East Link light rail extension project. This will be achieved by constructing a new lane, thereby maintaining all existing general purpose lanes. Aerial images depict roadway striping before and after construction.

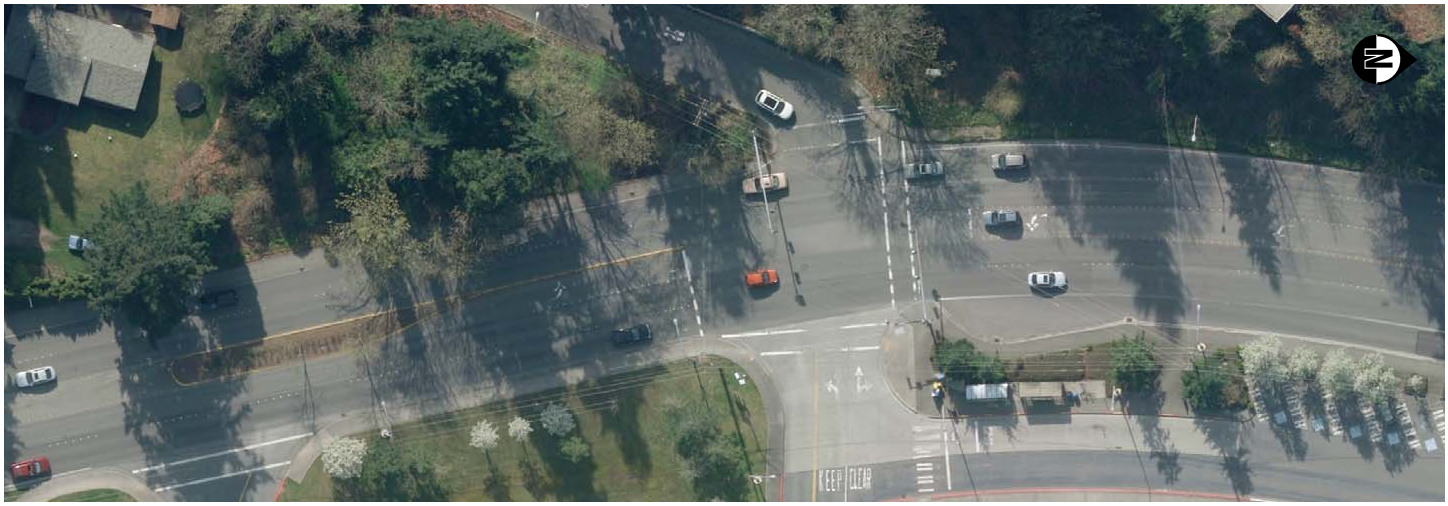


Figure 102 Prioritization of the proposed transit running way and spot improvement projects.

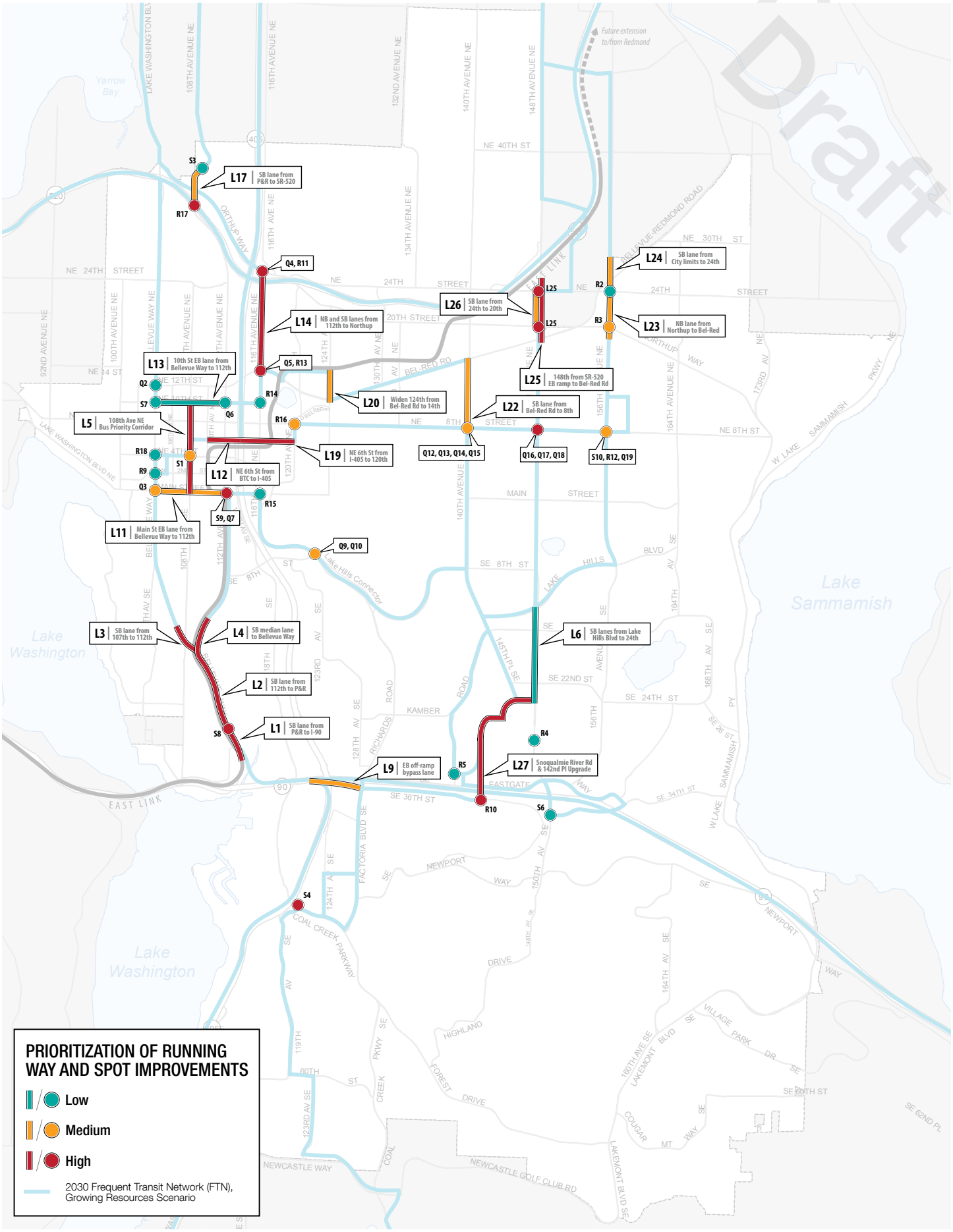


Figure 103 (top) Brochure for the Bellevue College Connection: 142nd Pl SE / Snoqualmie River Rd Multimodal Transportation Corridor (Project L27).

Figure 104 (bottom) Before and after aerial views of a new mutli-modal western gateway into Bellevue College on Snoqualmie River Rd. Improvements include reconstructed roadways to accommodate frequent bus service, new bus stops with shelters, and an off-street path facility for pedestrians and bicyclists.

Plan (TFP) or Capital Investment Program (CIP), (2) the necessity of a project in order to implement the 2030 FTN route structure, and (3) specific guidance provided by the Transportation Commission during the Capital Element planning process.

The Bellevue College Connection (Project L27; see Figure 103 and Figure 104) provides an instructive example of a project affected by several of the refinement considerations. Though its base priority is Low because much of the 142nd Pl SE/ Snoqualmie River Rd corridor is not affected by general purpose traffic, the project's final prioritization is High because it is has an associated TFP project (TFP-252), is necessary to restructuring service between Eastgate and Bellevue College, and was identified by the Transportation Commission as being of specific interest to pursue as soon as possible. During the course of the Capital Element planning process, Sound Transit added this project to its long-range plan, making the project eligible for potential inclusion in future Sound Transit funding programs, such as the forthcoming ST3.

Other high-priority projects include four HOV lane projects (L1, L2, L3, and L4) that would be added to the right-of-way along Bellevue Way SE and 112th Ave SE (see Figure 101), a queue jump project (Q5) on 116th Ave NE for northbound buses turning west onto Northup Way (see Figure 105), and the NE 6th St HOV Extension (Project L19), which will extend the existing NE 6th St HOV direct access ramp bridge from the center of I-405 east to 120th Ave NE. Running Way Project L23 and L24 provides an example of a project that is ranked medium priority in the long-term but high-priority in the short-term (see Figure 106. Although the long-term project prioritization will serve as the primary means by which potential projects are advanced for consideration for inclusion in the Transportation Facilities Plan (TFP) and Capital Investment Program (CIP) over the twenty-year implementation period of the Transit Master Plan,

projects have also been assigned supplemental short-term priorities to assist with the identification of projects in the current budget cycle, which would advance projects for implementation in the short-term based on available city resources and grant funding eligibility.

For additional information about individual projects being proposed, as well as the long-term and supplemental short-term prioritization processes, refer to the Transit Capital Vision Report.

Draft

Figure 105 Spot Improvement Project Q5: Queue jump lane on NE 116th St for left turning, northeast-bound traffic at Northup Way. Aerial images depict roadway striping before and after lane reconfiguration. This concept maintains all general purpose travel lanes and requires no new lane construction—both suitable qualities for a potential 'quick win' project.

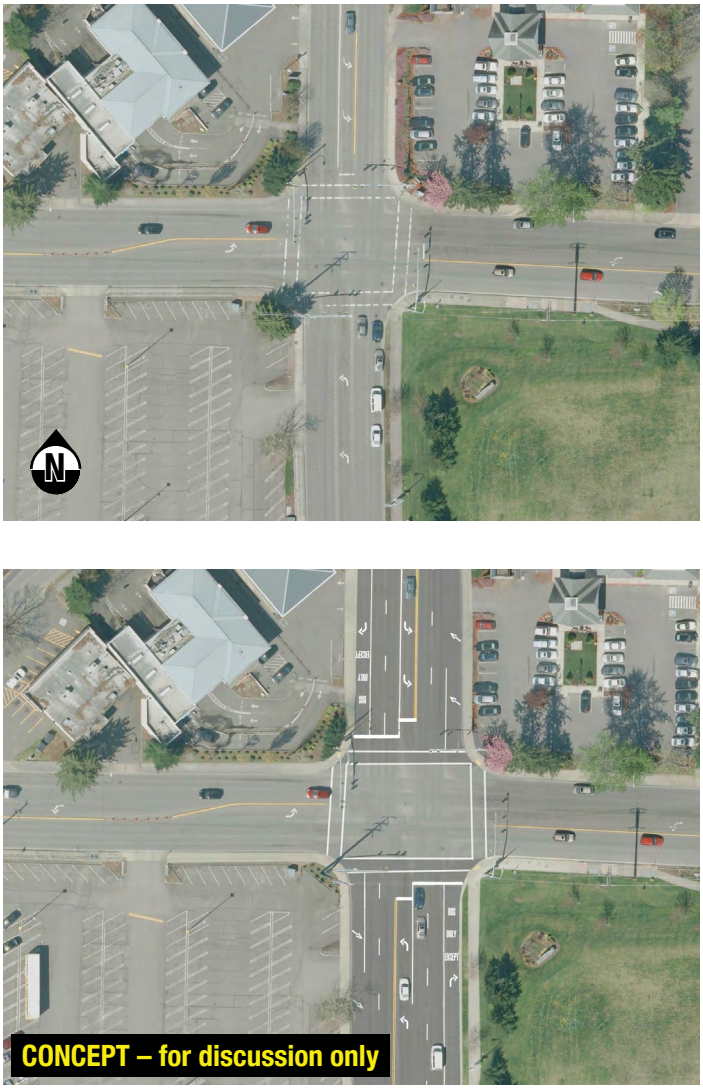


Figure 106 Running Way Improvement Projects L23 and L24: BAT lanes would be constructed on 156th Ave NE northbound from Northup Way to NE 24th St and southbound from city limits to NE 24th St, respectively. Aerial images depict roadway striping before and after lane reconfiguration. These concepts both maintain all existing general purpose travel lanes.

PHOTO BY John Tiscornia

SECTION 5:
APPENDICES

Draft

APPENDIX 1: GLOSSARY

Alight	Exiting a transit vehicle.
All-Day Service	Refers to transit service provided throughout the day, from morning through evening. King County Metro additionally specifies that all-day service provides connections between designated regional growth centers, manufacturing/industrial centers, and other areas of concentrated activity, and that it serves a variety of travel needs and trip purposes.
Automatic Passenger Count (APC)	An automated system that counts the number of passengers boarding and alighting a transit vehicle. The data collected from such a system is most commonly used by transit service planners to determine such things as ridership, typical vehicle loads, and the relative use of individual bus stops.
Average Daily Ridership	The average number of daily rides of a particular revenue service, typically extrapolated from sample passenger counts obtained from APC equipment.
Boarding	To get on/into a transit vehicle.
Bus Rapid Transit (BRT)	A bus rapid transit (BRT) system is a category of bus system design and operation that provides an enhanced quality of service more often associated with rail transit modes while retaining the flexibility and lower costs afforded by buses. The specific features required for a system to be considered a BRT service have not been officially defined by state or federal agencies; however, features generally considered to be central to such service include grade-separated right-of-ways, implementation of transit signal priority, peak-hour headways of less than 10 minutes, off-board fare payment, and high-quality, high capacity vehicles.
Bus Shelter	A structure or building constructed at a transit stop for the purpose of providing protection from the weather for passengers waiting for transit service. Bus shelters often also provide seating and/or schedule information for the passenger's comfort and convenience.
Bus Stop	Designated areas where passengers wait for, board, alight, and transfer between transit vehicles. Bus stops are indicated by specific signage and by curb and/or pavement markings, and they sometimes provide bus shelters.
Commute	Regular travel between home and a fixed location, such as work or school.
Cost Efficiency	The cost of providing a transit service compared to the amount of service provided. In this document, cost efficiency is expressed either as cost per platform mile or as cost per vehicle revenue hour.
Dial-a-Ride-Transit (DART)	King County Metro's Dial-a-Ride-Transit (DART) offers variable routing in certain defined service areas in King County. DART uses vans instead of standard buses to provide service off of regular fixed routes, allowing passengers to arrange a pick-up or drop-off closer to their home or destination. This provides greater flexibility to users while maintaining an appropriate level of transit service for areas not able to support regular fixed-route service by standard-size buses.
Deadhead (Miles or Hours)	The miles or hours traveled by a vehicle while not providing revenue service. This includes non-revenue travel to and from a garage, between routes, and scheduled time allocated for bus operator breaks.
Dwell Time	The amount of time that a transit vehicle spends stationary at a stop or station. Factors affecting dwell time include the time it takes for passengers to board and alight, pay fares, and a vehicle's schedule adherence, among other things.

Draft

Fixed Route	Transit service provided on a repetitive basis along a specific route according to a specified stops and time schedules.
Flyer Stop	See Freeway Station.
Freeway Station	Bus stops located on limited-access highways throughout King County that provide efficient service along major thoroughfares without requiring transit vehicles to fully exit a highway. Freeway stations are most common in suburban areas and are frequently paired with Park & Ride lots.
Frequency	How often a transit service operates, most precisely expressed by the number of trips per hour but commonly discussed in terms of headway. Higher service frequency (trips/hour) reflects better service, with buses coming more often and reducing waiting time.
Frequent Service	Service that operates every 15 minutes or better, seven days a week.
Headway	The scheduled time interval between any two revenue vehicles operating in the same direction on the same route. For example, a bus with a headway of 15 minutes is scheduled to arrive at a given stop every 15 minutes.
Interline	The transfer of a vehicle that is in operation from one route to another, generally for the purpose of improving staff or vehicle assignment efficiency. When this occurs where the termini of the routes meet, it is referred to as through routing, which provides benefits to users who would otherwise need to transfer between the two routes in addition to the operating efficiency benefits.
Load (Average or Maximum)	The number of passengers on-board a transit vehicle at any given time. Average load is a measure of how many passengers are typically on a transit vehicle during its revenue service. Maximum load is a measure of the greatest number of passengers observed on a transit vehicle over a given period of time. For the purposes of this document, maximum load actually refers to the average maximum load—that is, the average of the greatest number of passengers observed on a transit vehicle over a given period of time.
Manufacturing/ Industrial Center	An area of intensive manufacturing and/or industrial activity. Defined by the Puget Sound Regional Council's Vision 2040 plan.
Mobility Management Area (MMA)	Mobility Management Areas (MMAs) are geographic areas for which traffic is managed and congestion standards are established to help guide land development and transportation improvement decisions.
Off-board Payment	A payment system where passengers pay fares at designated ticket vending machines or smart card readers prior to boarding transit vehicles. Off-board payment systems are typically used to reduce vehicle dwell time due to slow passenger boarding and fare payment.
On-time Performance	For fixed-route service, the percentage of departures from scheduled time points that are five minutes late or better.
ORCA Card	A contactless, stored value smart card used for payment of public transport fares in the Puget Sound region. The card's name is an acronym for "One Regional Card for All," as the card is accepted as a method of payment on buses, light rail, ferries, trains, and streetcars operated by numerous regional transit agencies including King County Metro, Sound Transit, Community Transit, Pierce Transit, Kitsap Transit, Everett Transit, and Washington State Ferries.

Draft

Park-and-Ride	A parking area for automobile drivers and bicycle riders who then board transit vehicles, shuttles or carpools from these locations to reach their destinations. Park & Ride lots are designated by King County Metro and may be either expressly constructed for this purpose or loaned from other organizations or businesses, most commonly churches, that have excess parking capacity available.
Passenger Miles	A measure of service utilization that represents the cumulative sum of the distances traveled on-board a transit vehicle by each passenger using a given service.
Peak Service	Service provided during the periods of the morning (6:00-9:00) and afternoon/ evening (3:00-6:00) when demand for transportation is heaviest.
Platform Hours (or Miles)	The total scheduled time (or distance) that a transit vehicle spends between leaving from and returning to base, including both revenue service and deadhead time. Platform hours and miles are used as indicators of service efficiency or utilization through such metrics as rides per platform hour and passenger miles per platform mile.
Productivity	A measure of service efficiency comparing passengers carried to service operated. King County Metro considers productivity to be determined by two measures: rides per platform hour and passenger miles per platform mile. More generally, it is a ratio of transit service output (e.g. annual rides) to units of service input (e.g. annual platform hours).
Revenue Hour	The number of hours during which a transit vehicle is in operation and providing revenue service, including layover and recovery time but excluding deadhead time.
Revenue Mile	The number of miles operated by a transit vehicle providing revenue service, including that traveled during layover and recovery time but excluding deadhead miles.
Rides per Platform Hour	A measure of the total number of people who board a transit vehicle relative to the total number of hours that vehicle operates, including both revenue and deadhead hours. This is one of two measures considered by Metro to evaluate individual route productivity. Routes with many riders boarding the bus during each trip tend to perform well on this measure.
Service Span	The time period over which a route provides revenue service on a given day of the week. This is sometimes referred to in this document as Hours of Service.
Transfer (aka Connection)	(1) The process of a passenger changing from one transit vehicle to another, often without need for additional payment. (2) The slip of paper issued by a King County Metro vehicle operators to a passenger for the purpose of allowing the passenger to change from one transit vehicle to another without need for additional payment. Sound Transit no longer issues paper transfers, but both agencies allow passengers to use an ORCA card to transfer.
Transit Center	A transit station that functions as the convergence point for multiple routes, lines, or modes of transportation. Such facilities are designed to facilitate the flow of transit vehicles and the boarding, alighting, and transferring of passengers between those vehicles and the services they provide.
Trip	A one-way movement of an individual or vehicle between two points. The most common type, called an "unlinked passenger trip," further specifies that each time an individual transfers between vehicles or reaches an intermediary destination (e.g. stopping at a day care center en route to work), an additional unlinked trip has been made.

Draft

APPENDIX 2: TMP PROJECT PRINCIPLES

The City Council envisions a fully integrated and user-friendly network of transit services for Bellevue that supports the city's growth, economic vitality, and enhanced livability, and has developed the following set of project principles to direct development of the Transit Master Plan.

1. Support planned growth and development in Bellevue with a bold transit vision that encourages long-term ridership growth.	The dynamic nature of Bellevue's economic expansion requires a bold transit vision supported by practical, achievable strategies in the near term that set a solid foundation for longer term improvements through 2030. The Transit Master Plan should identify, evaluate, and prioritize transit investments that are responsive to a range of financial scenarios (cuts/status-quo/aspirational) and attune to different time horizons (near/mid/long term).
2. Engage community stakeholders in setting the priorities for transit delivery.	A comprehensive public engagement strategy should result in meaningful input on transit services and facilities from a range of stakeholders including residents, businesses, major institutions, neighboring cities, transportation agencies, and others (e.g., community associations, Network on Aging, Bellevue School District, Bellevue College, Chamber of Commerce, Bellevue Downtown Association). Special attention will be required to enlist the participation of "under-represented" communities such as immigrants, low-income and non-native English speakers.
3. Determine where and how transit investments can deliver the greatest degree of mobility and access possible for all populations.	The Transit Master Plan should look to the future and be compatible with Bellevue's land use and transportation plans and the challenges and opportunities of changing demographics, land use characteristics, and travel patterns. Following consultations with the community, demand forecasting, and a review of industry best practices and emerging technologies, this initiative will identify the steps required to create a public transportation system that is easy to use by all people in Bellevue for trips within Bellevue and to regional destinations.
4. Incorporate other transit-related efforts (both bus and light rail) underway in Bellevue and within the region.	The Transit Master Plan should incorporate local and regional transportation projects and plans that have been approved and/or implemented since the Bellevue Transit Plan was adopted in 2003. Transportation system changes include East Link, SR 520 expansion and tolling, and improvements to I-90 and I-405. Planning changes include the updated Bel-Red Subarea Plan, the Wilburton Subarea Plan and the Eastgate/I-90 Land Use and Transportation Project. Through coordination with local and regional transportation plans, the Transit Master Plan should outline a strategy to leverage the investment in public transportation projects to the benefit of Bellevue residents and businesses.
5. Identify partnership opportunities to further extend transit service and infrastructure.	While transit infrastructure is typically funded through large capital funding programs, other less traditional funding mechanisms can be utilized to pay for improvements vital to support transit communities and/or achieve higher transit ridership. The Transit Master Plan should undertake an analysis of partnership opportunities that the City might want to consider with other government organizations (e.g., Bellevue School District, Bellevue College, Metro, Sound Transit), human service agencies, and private corporations, to improve transit service delivery in Bellevue. This analysis will explore alternatives to traditional transit service delivery.
6. Develop measures of effectiveness to evaluate transit investments and to track plan progress.	The Bellevue Comprehensive Plan presently includes the following metrics/benchmarks related to transit: (i) mode split targets within each of the City's Mobility Management Areas [Table TR.1 – Area Mobility Targets]; (2) transit service frequency improvement targets between Downtown, Overlake, Crossroads, Eastgate, and Factoria [TR.8 – 10 Year Transit Vision]; and, (3) guidance found in 44 transit-supportive policies. The Transit Master Plan will revisit these metrics, and where necessary, propose modifications to better reflect present and future conditions.

Draft

APPENDIX 3: TRANSIT MASTER PLAN DOCUMENT LIBRARY

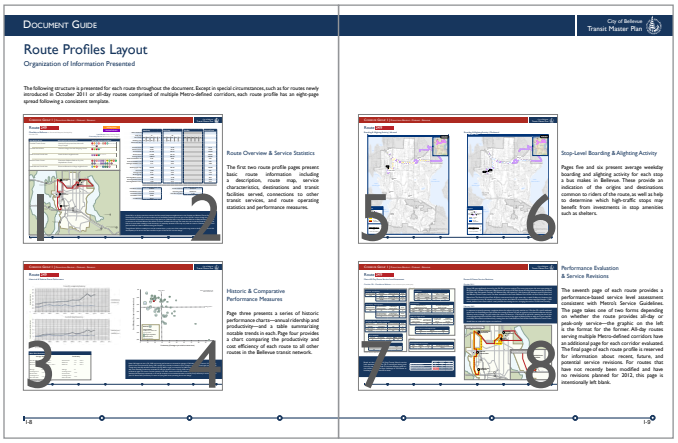


Figure 107 These pages from the *Bellevue Transit Network Profile* depict the layout of each route profile contained in the document.

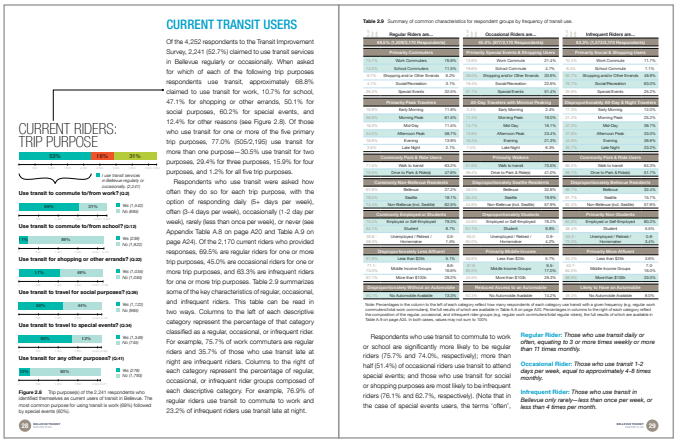


Figure 108 These pages from the *TIS Summary Report* describe common characteristics of current users of transit in Bellevue.

Service Element Documents

Bellevue Transit Network Profile – This volume comprehensively documents all bus routes that served Bellevue between Fall 2010 and Fall 2011, which are examined both individually and in relation to the overall network operated. Each route profile includes route descriptions, connection opportunities, Fall 2010 performance measures, Metro's service level assessment results, recent and planned future route revisions, and route maps color-coded according to the destinations served to facilitate future analysis. This document serves as the baseline for considering transit performance in Bellevue, reflecting the system as it operated prior to and immediately following King County Metro's major Eastside service restructure in October 2011.

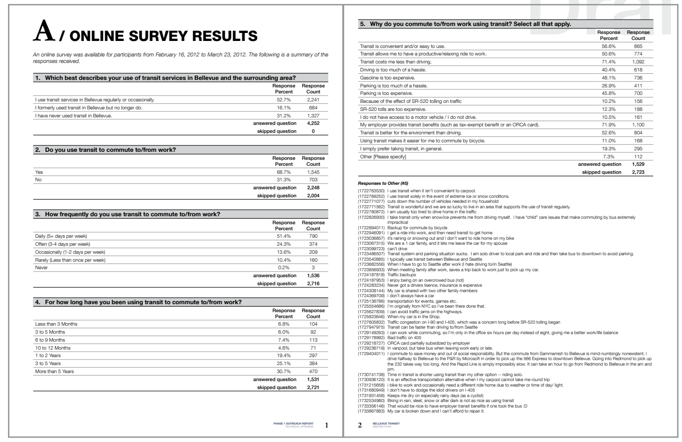
Transit Improvement Survey Summary Report – The Bellevue Transit Improvement Survey (TIS) was administered online between February and March of 2012, during which time it was completed by more than 4,200 respondents. The *TIS Summary Report* summarizes the results obtained, profiling Bellevue's current transit market, the perceptions of transit service in Bellevue by the public, and the priorities of the public for improving service and addressing potential future budget shortfalls. The document provides a comprehensive examination of multiple choice responses by user type (current-, former-, and non-riders), trip purpose (work, school, shopping, social/recreation, and special events), and various demographic characteristics, and also categorizes the several thousand write-in responses that were submitted by theme.

Phase 1 Outreach Report: Technical Appendix – This document serves as the technical appendix to the *TIS Summary Report*, presenting the complete results of the Transit Improvement Survey exactly as submitted by survey respondents without analysis, categorization, or any potential source of bias.

Transit Master Plan Forum Report – The Transit Master Plan Forum was an outreach event held on September 18, 2012. This document summarizes the major themes expressed by Mayor Conrad Lee, Councilmember Kevin Wallace, and the twenty-four members of the Transportation, Planning, Arts, and Human Services Commissions and the Parks and Community Services Board who were in attendance. All of Bellevue's board and commission members were invited to the event for the purposes of broadening the TMP's outreach and refining Council's adopted Project Principles into actionable priorities to guide development of the transit service vision.

Bellevue Transit Status Report – This report details the service and infrastructure improvements completed since the adoption of the 2003 Bellevue Transit Plan and highlights transit usage levels and unmet needs in Bellevue that will be taken into account in the TMP process. The document serves as a brief precursor to the more comprehensive *Existing and Future Conditions Report*.

Transit Network Profile: 2011-12 Update – An update to the *Bellevue Transit Network Profile*, this volume comprehensively documents all bus routes that served Bellevue between Fall 2011 and Spring 2012. Performance statistics are presented for both service periods to facilitate consideration of how transit performance changed in the months following the October 2011 service restructure. This update also introduced the segmentation of route performance statistics by time of day.



A / ONLINE SURVEY RESULTS

An online survey was available for participants from February 16, 2012 to March 23, 2012. The following is a summary of the responses received.

1. Which best describes your use of transit services in Bellevue and the surrounding area?	Response Percent	Response Count
I use transit services in Bellevue regularly or occasionally.	52.7%	2,241
I formerly used transit in Bellevue but no longer do.	16.1%	684
I have never used transit in Bellevue.	31.2%	1,327
answered question		4,252
skipped question		0

2. Do you use transit to commute to/from work?	Response Percent	Response Count
Yes	68.7%	1,545
No	31.3%	703
answered question		2,248
skipped question		2,004

3. How frequently do you use transit to commute to/from work?	Response Percent	Response Count
Daily (5+ days per week)	51.4%	790
Often (3-4 days per week)	24.3%	374
Occasionally (1-2 days per week)	13.6%	209
Rarely (Less than once per week)	10.4%	160
Never	0.2%	3
answered question		1,536
skipped question		2,716

4. For how long have you been using transit to commute to/from work?	Response Percent	Response Count
Less than 3 Months	6.8%	104
3 to 5 Months	6.0%	92
6 to 9 Months	7.4%	113
10 to 12 Months	4.6%	71
1 to 2 Years	19.4%	297
3 to 5 Years	25.1%	384
More than 5 Years	30.7%	470
answered question		1,531
skipped question		2,721

PHASE 1 OUTREACH REPORT TECHNICAL APPENDIX 1

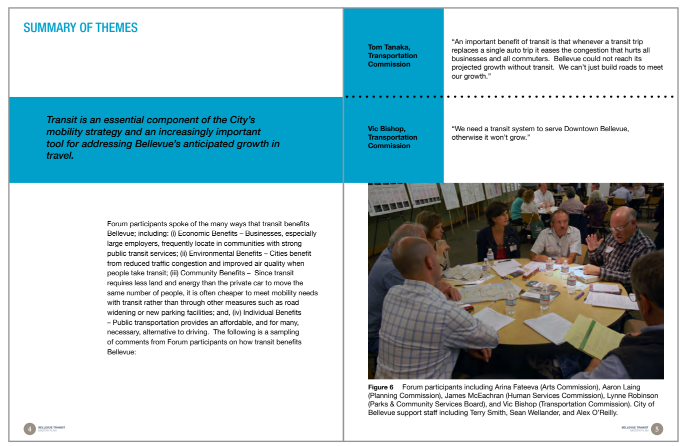
5. Why do you commute to/from work using transit? Select all that apply.	Response Percent	Response Count
Transit is convenient and/or easy to use.	56.6%	865
Transit allows me to have a productive/relaxing ride to work.	50.6%	774
Transit costs me less than driving.	71.4%	1,092
Driving is too much of a hassle.	40.4%	618
Gasoline is too expensive.	48.1%	736
Parking is too much of a hassle.	26.9%	411
Parking is too expensive.	45.8%	700
Because of the effect of SR-520 tolling on traffic	10.2%	156
SR-520 tolls are too expensive.	12.3%	188
I do not have access to a motor vehicle / I do not drive.	10.5%	161
My employer provides transit benefits (such as tax-exempt benefit or an ORCA card).	71.9%	1,100
Transit is better for the environment than driving.	52.6%	804
Using transit makes it easier for me to commute by bicycle.	11.0%	168
I simply prefer taking transit, in general.	19.3%	295
Other (Please specify)	7.3%	112
answered question		1,529
skipped question		2,723

Responses to Other (#5)

(1722763530) I use transit when it isn't convenient to carpool.
(1722769252) I use transit solely in the event of extreme ice or snow conditions.
(1722771077) cuts down the number of vehicles needed in my household
(1722771562) Transit is wonderful and we are so lucky to live in an area that supports the use of transit regularly.
(1722780872) I am usually too tired to drive home in the traffic
(1722826930) I take transit only when snow/ice prevents me from driving myself. I have "child" care issues that make commuting by bus extremely impractical
(1722894011) Backup for commute by bicycle
(1722946091) I get a ride into work, and then need transit to get home
(1723036857) it's raining or snowing out and I don't want to ride home on my bike
(1723067315) We are a 1 car family, and it lets me leave the car for my spouse
(1723099723) can't drive
(1723486507) Transit system and parking situation sucks. I am solo driver to local park and ride and then take bus to downtown to avoid parking.
(1723540885) I typically use transit between Bellevue and Seattle
(1723682556) When I have to go to Seattle after work (I hate driving to/in Seattle)
(1723856933) When meeting family after work, saves a trip back to work just to pick up my car.
(1724187818) Traffic backups
(1724187953) I enjoy being on an overcrowed bus (not)
(1724283234) Never got a drivers lisence, insurance is expensive
(1724308144) My car is shared with two other family members
(1724369709) I don't always have a car
(1725136786) transportation for events, games etc.
(1725554686) i'm originally from NYC so i've been there done that.
(1725627839) I can avoid traffic jams on the highways.
(1725823646) When my car is in the Shop.
(1727605832) Traffic congestion on I-90 and I-405, which was a concern long before SR-520 tolling began
(1727947975) Transit can be faster than driving to/from Seattle
(1729149263) I can work while commuting, so I'm only in the office six hours per day instead of eight, giving me a better work/life balance
(1729178992) Bad traffic on 405
(1729218727) ORCA card partially subsidized by employer
(1729236719) In vanpool, but take bus when leaving work early or late.
(1729404011) I commute to save money and out of social responsibility. But the commute from Sammamish to Bellevue is mind-numbingly nonexistent. I drive halfway to Bellevue to the P&R by Microsoft in order to pick up the 566 Express to downtown Bellevue. Going into Redmond to pick up the 232 takes way too long. And the Rapid Line is simply impossibly slow. It can take an hour to go from Redmond to Bellevue in the am and pm.
(1730741738) Time in transit is shorter using transit than my other option -- riding solo.
(1730936120) It is an effective transportation alternative when I my carpool cannot take me round trip
(1731215658) i bike to work and occasionally need a different ride home due to weather or time of day/ light.
(1731680949) I don't have to dodge the idiot drivers on I-405
(1731931458) Keeps me dry on especially rainy days (as a cyclist)
(1732534980) Bking in rain, sleet, snow or after dark is not as nice as using transit
(1733356146) That would be nice to have employer transit benefits if one took the bus :D
(1733867883) My car is broken down and I can't afford to repair it.

2 BELLEVUE TRANSIT MASTER PLAN

Figure 109 These pages from the *Outreach Report: Technical Appendix* show the multiple-choice results and write-in responses to questions 1 through 5 of the Transit Improvement Survey.



SUMMARY OF THEMES

Transit is an essential component of the City's mobility strategy and an increasingly important tool for addressing Bellevue's anticipated growth in travel.

Forum participants spoke of the many ways that transit benefits Bellevue; including: (i) Economic Benefits – Businesses, especially large employers, frequently locate in communities with strong public transit services; (ii) Environmental Benefits – Cities benefit from reduced traffic congestion and improved air quality when people take transit; (iii) Community Benefits – Since transit requires less land and energy than the private car to move the same number of people, it is often cheaper to meet mobility needs with transit rather than through other measures such as road widening or new parking facilities; and, (iv) Individual Benefits – Public transportation provides an affordable, and for many, necessary, alternative to driving. The following is a sampling of comments from Forum participants on how transit benefits Bellevue:

4 BELLEVUE TRANSIT MASTER PLAN

Tom Tanaka, Transportation Commission "An important benefit of transit is that whenever a transit trip replaces a single auto trip it eases the congestion that hurts all businesses and all commuters. Bellevue could not reach its projected growth without transit. We can't just build roads to meet our growth."

Vic Bishop, Transportation Commission "We need a transit system to serve Downtown Bellevue, otherwise it won't grow."

Figure 6 Forum participants including Arina Fateeva (Arts Commission), Aaron Laing (Planning Commission), James McEachran (Human Services Commission), Lynne Robinson (Parks & Community Services Board), and Vic Bishop (Transportation Commission). City of Bellevue support staff including Terry Smith, Sean Wellander, and Alex O'Reilly.

BELLEVUE TRANSIT MASTER PLAN 5

Figure 110 One of the themes expressed by TMP Forum participants: "Transit is an essential component of the City's mobility strategy..."

STATUS REPORT

On June 2, 2003 the Bellevue City Council adopted the Bellevue Transit Plan (see Figure 1). The 2003 Plan was a major step forward in articulating what improvements are needed in transit service and capital investments throughout Bellevue and served as an important reference document for collaborations with the City's transit service providers. The service and capital partnerships resulting from this vision have enhanced transit's role in Bellevue.

INFRASTRUCTURE IMPROVEMENTS

Since the adoption of the 2003 Bellevue Transit Plan, hundreds of millions of dollars in HOV access ramps, transit centers, park-and-ride lots, and speed and reliability projects were completed in Bellevue in support of transit operations. Figure 2 on page 4 reflects the array of transit capital projects completed since 2003 including:

- Bellevue Transit Center – In 2003, Sound Transit expanded the Bellevue Transit Center to include ten bus bays, shelter improvements and rider amenities. Additional bus stops and roadway improvements on 108th Avenue NE, 106th Avenue NE and east of the transit center on Northeast Sixth Street have improved transit and traffic flow in downtown Bellevue and enable more than 100 buses during peak periods to move efficiently through the transit center. *Total funding: $16 million.*

Figure 1 The Bellevue Transit Master Plan builds on the successes of the City's 2003 Transit Plan by positioning the City to leverage partnerships with regional transit agencies to enhance the existing bus system.

BELLEVUE TRANSIT MASTER PLAN 3

Eastgate Park & Ride Expansion | I-90 Two-Way Transit HOV | Eastgate Direct Access Ramp | Bellevue Transit Center | RapidRide B Line | Access Downtown

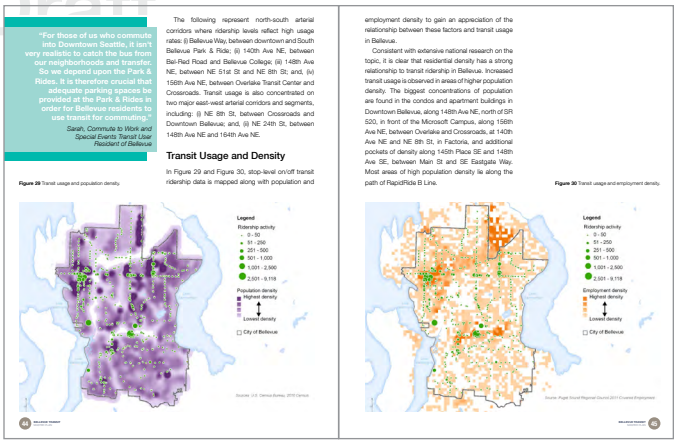
Figure 2 Looking to the future, these capital projects in support of transit will be dwarfed by the upcoming investment in the East Link light rail extension from Seattle to Bellevue.

- Eastgate Park & Ride – In 2004, King County expanded the Eastgate Park & Ride from a 696 stall facility to a structured complex that can accommodate 1,646 vehicles. In spite of the large number of parking spaces, the Eastgate Park and Ride is already at capacity with a utilization ratio of 97 percent (Second Quarter 2012). *Total funding: $27 million.*
- Bellevue HOV Access Project (Access Downtown) – Completed in 2005, the Bellevue Access HOV project makes it easier to travel in an out of downtown Bellevue from the freeway. The project provides a new interchange on I-405 at Northeast Sixth Street for buses and carpools, giving buses direct access to the expanded Bellevue Transit Center. It improves freeway interchanges at NE 4, NE 8, and SE 8 streets including improvements to nearby city street intersections. *Total funding: $144 million.*
- Eastgate Transit Access Ramps – WSDOT and Sound Transit partnered in 2006 to complete the Eastgate Transit Access to connect the existing 142nd Place SE bridge to the I-90 HOV lanes. The addition of two ramps (one on the east and one on

4 BELLEVUE TRANSIT MASTER PLAN

Figure 111 These pages from the *Transit Status Report* describe infrastructure improvements made since adoption of the 2003 *Bellevue Transit Plan.*

Draft



"For those of us who commute into Downtown Seattle, it isn't very realistic to catch the bus from our neighborhoods and transfer. So we depend upon the Park & Rides. It is therefore crucial that adequate parking spaces be provided at the Park & Rides in order for Bellevue residents to use transit for commuting."

Sarah, Commute to Work and Special Events Transit User Resident of Bellevue

The following represent north-south arterial corridors where ridership levels reflect high usage rates: (i) Bellevue Way, between downtown and South Bellevue Park & Ride; (ii) 140th Ave NE, between Bel-Red Road and Bellevue College; (iii) 148th Ave NE, between NE 51st St and NE 8th St; and, (iv) 156th Ave NE, between Overlake Transit Center and Crossroads. Transit usage is also concentrated on two major east-west arterial corridors and segments, including: (i) NE 8th St, between Crossroads and Downtown Bellevue; and, (ii) NE 24th St, between 148th Ave NE and 164th Ave NE.

Transit Usage and Density

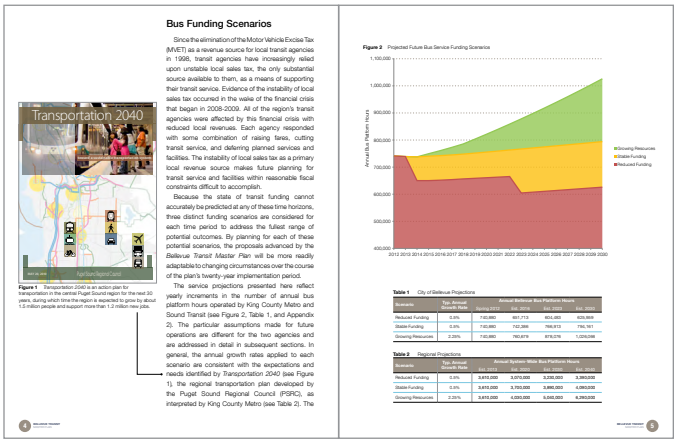
In Figure 29 and Figure 30, stop-level on/off transit ridership data is mapped along with population and employment density to gain an appreciation of the relationship between these factors and transit usage in Bellevue.

Consistent with extensive national research on the topic, it is clear that residential density has a strong relationship to transit ridership in Bellevue. Increased transit usage is observed in areas of higher population density. The biggest concentrations of population are found in the condos and apartment buildings in Downtown Bellevue, along 148th Ave NE, north of SR 520, in front of the Microsoft Campus, along 156th Ave NE, between Overlake and Crossroads, at 140th Ave NE and NE 8th St, in Factoria, and additional pockets of density along 145th Place SE and 148th Ave SE, between Main St and SE Eastgate Way. Most areas of high population density lie along the path of RapidRide B Line.

Figure 29 Transit usage and population density.

Figure 30 Transit usage and employment density.

Figure 114 These maps from the *Existing and Future Conditions Report* show how transit ridership relates to population and employment density in Bellevue.



Bus Funding Scenarios

Since the elimination of the Motor Vehicle Excise Tax (MVET) as a revenue source for local transit agencies in 1998, transit agencies have increasingly relied upon unstable local sales tax, the only substantial source available to them, as a means of supporting their transit service. Evidence of the instability of local sales tax occurred in the wake of the financial crisis that began in 2008-2009. All of the region's transit agencies were affected by this financial crisis with reduced local revenues. Each agency responded with some combination of raising fares, cutting transit service, and deferring planned services and facilities. The instability of local sales tax as a primary local revenue source makes future planning for transit service and facilities within reasonable fiscal constraints difficult to accomplish.

Because the state of transit funding cannot accurately be predicted at any of these time horizons, three distinct funding scenarios are considered for each time period to address the fullest range of potential outcomes. By planning for each of these potential scenarios, the proposals advanced by the *Bellevue Transit Master Plan* will be more readily adaptable to changing circumstances over the course of the plan's twenty-year implementation period.

The service projections presented here reflect yearly increments in the number of annual bus platform hours operated by King County Metro and Sound Transit (see Figure 2, Table 1, and Appendix 2). The particular assumptions made for future operations are different for the two agencies and are addressed in detail in subsequent sections. In general, the annual growth rates applied to each scenario are consistent with the expectations and needs identified by *Transportation 2040* (see Figure 1), the regional transportation plan developed by the Puget Sound Regional Council (PSRC), as interpreted by King County Metro (see Table 2). The

Figure 1 *Transportation 2040* is an action plan for transportation in the central Puget Sound region for the next 30 years, during which time the region is expected to grow by about 1.5 million people and support more than 1.2 million new jobs.

Figure 2 Projected Future Bus Service Funding Scenarios

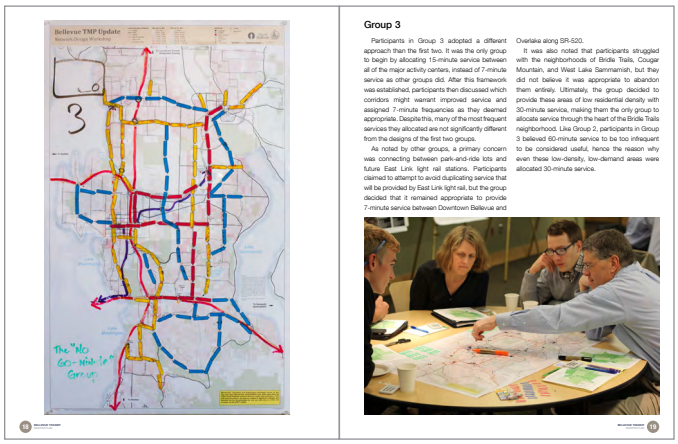
Table 1 City of Bellevue Projections

Scenario	Typ. Annual Growth Rate	Annual Bellevue Bus Platform Hours			
		Spring 2012	Dec. 2016	Dec. 2023	Dec. 2030
Reduced Funding	0.5%	740,880	691,713	654,083	623,968
Stable Funding	0.9%	740,880	742,288	768,913	796,761
Growing Resources	2.35%	740,880	790,879	879,276	1,029,338

Table 2 Regional Projections

Scenario	Typ. Annual Growth Rate	Annual System Wide Bus Platform Hours			
		Dec. 2012	Dec. 2016	Dec. 2023	Dec. 2030
Reduced Funding	0.9%	3,610,000	3,070,000	3,230,000	3,390,000
Stable Funding	2.5%	3,610,000	3,700,000	3,990,000	4,090,000
Growing Resources	2.35%	3,610,000	4,050,000	5,040,000	6,290,000

Figure 112 These pages from the *Funding Scenarios Report* depict the projected number of annual platform hours operated under each of the three funding scenarios between 2012 and 2030.



Group 3

Participants in Group 3 adopted a different approach than the first two. It was the only group to begin by allocating 15-minute service between all of the major activity centers, instead of 7-minute service as other groups did. After this framework was established, participants then discussed which corridors might warrant improved service and assigned 7-minute frequencies as they deemed appropriate. Despite this, many of the most frequent services they allocated are not significantly different from the designs of the first two groups.

As noted by other groups, a primary concern was connecting between park-and-ride lots and future East Link light rail stations. Participants claimed to attempt to avoid duplicating service that will be provided by East Link light rail, but the group decided that it remained appropriate to provide 7-minute service between Downtown Bellevue and Overlake along SR-520.

It was also noted that participants struggled with the neighborhoods of Bridle Trails, Cougar Mountain, and West Lake Sammamish, but they did not believe it was appropriate to abandon them entirely. Ultimately, the group decided to provide these areas of low residential density with 30-minute service, making them the only group to allocate service through the heart of the Bridle Trails neighborhood. Like Group 2, participants in Group 3 believed 60-minute service to be too infrequent to be considered useful, hence the reason why even these low-density, low-demand areas were allocated 30-minute service.

Figure 113 One of six networks developed at the Transit Network Design Workshop, this one by Group 3 attempts to balance frequent high-ridership and infrequent coverage services.

Existing and Future Conditions Report – Drawing from several of the reports noted above, the *Existing and Future Conditions Report* summarizes the major findings related to current transit operations and performance, priorities expressed by the public about this network, projected growth in population, employment, and ridership, and anticipated changes resulting from the introduction of East Link light rail and various planned and potential investments in local street and transit infrastructure.

Funding Scenarios Report – Developed through informal conversations with officials from King County Metro and Sound Transit and consultation of published reports by these agencies and the Puget Sound Regional Council's Transportation 2040, the *Funding Scenarios Report* describes the three bus funding scenarios that are considered in the TMP and defines the assumptions that were made to arrive at these results.

Transit Network Design Workshop Report – The Transit Network Design Workshop was an outreach event held on January 31, 2013. Various transit officials, board and commission members, and other local stakeholders were invited to take part in the workshop, where they were asked to further articulate priorities for transit services in and around Bellevue, and to brainstorm what corridors should be prioritized in the 2030 network and what frequency of service should be allocated to each. This report documents the six networks created by workshop participants, a summary of the common themes and notable differences identified by project consultant Jarrett Walker, and the service priorities identified by participants during audience polling.

Market Driven Strategies Report – This report identifies the framework within which the transit service vision was ultimately developed, including six essential qualities embodied by the service vision—known as "Abundant Access"—and the six market-driven strategies endorsed by the TMP to achieve this vision. These strategies represent the course advocated when confronted with the various fundamental tradeoffs inherent in the provision of transit service, which were developed by reflecting to the extent possible the body of input and assortment of guidance obtained through the various efforts described in the aforementioned reports.

Figure 115 These pages from the *Market Driven Strategies Report* explain three of the six strategies advanced by the "Abundant Access" service vision.

Transit Service Vision Report – This report represents the culmination of the Service Element planning process. In addition to summarizing the service planning process, which was based on guidance obtained from the City Council, the public, local transit service providers, and other stakeholders, this document presents route-level recommendations that are responsive to three financial scenarios (reduced, stable, and growing resources) and attune to three time horizons (2015, 2022, and 2030). The 2030 Frequent Transit Network (FTN), comprised of the core services included in the most abundant scenario (2030 Growing Resources), will serve the vast majority of all ridership in Bellevue. The FTN is therefore used as the basis for the transit-supportive infrastructure planning completed in the Capital Element.

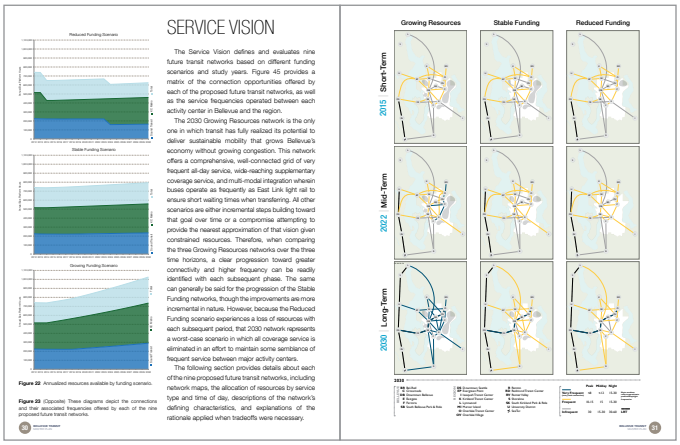


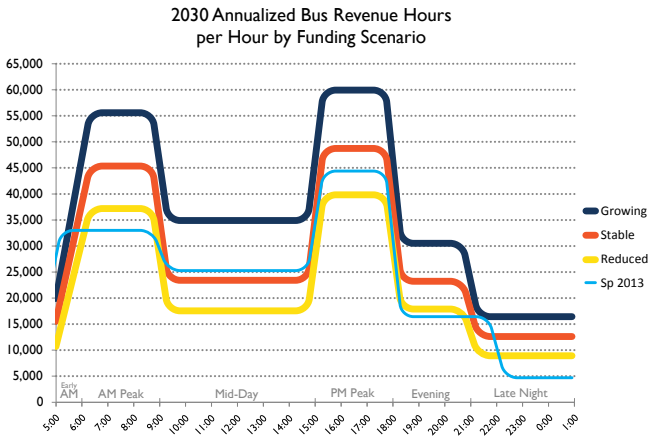
Figure 116 These pages from the Transit Service Vision Report present the nine future transit networks proposed for Bellevue, consistent with the three funding scenarios depicted in the charts on the left and the three time horizons considered by the TMP (2015, 2022, and 2030).

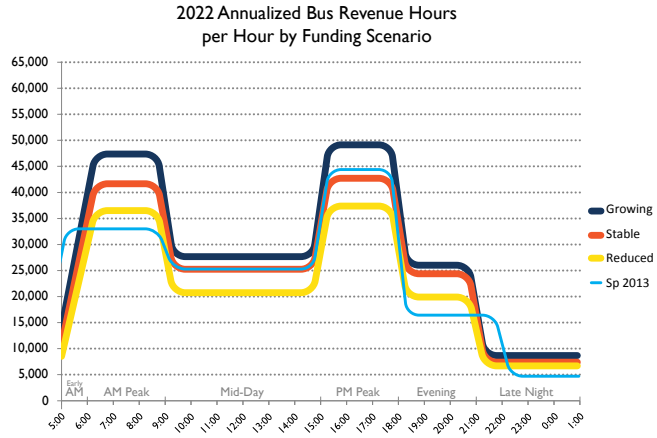
Draft

APPENDIX 4: SERVICE VISION RESOURCE ALLOCATION

The tables and charts presented here reflect the allocation of available resources for each of the nine scenarios presented in the Service Vision.

The hourly figures depicted are averaged from the total revenue hours operated during each period and therefore do not represent a precise operating schedule. Each scenario also includes unallocated contingency hours in addition to those depicted in the chart. Time periods are currently defined differently than in future scenarios, so Spring 2012 figures for the Early AM period (4:00-5:00a) are not depicted above.





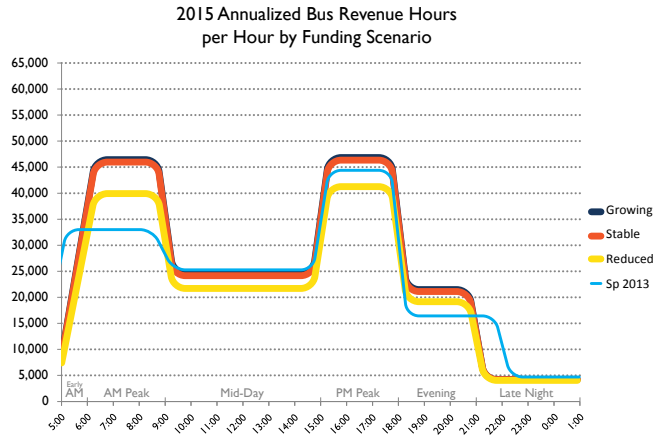


Figure 117 Annualized bus revenue hours per hour by funding scenario.

Draft

Table 6 Allocation of resources in 2030 by service type and funding scenario.

Service Type	2030 Growing		2030 Stable		2030 Reduced	
	Plat Hrs	%	Plat Hrs	%	Plat Hrs	%
Frequent Express	261,050	26%	228,011	29%	228,368	37%
Frequent Rapid	169,605	17%	95,243	12%	91,377	15%
Frequent Local	272,817	27%	220,585	28%	183,283	30%
Coverage (Standard Local)	171,940	17%	124,879	16%	0	0%
Peak-only	145,715	14%	116,632	15%	116,632	19%
Contingency reserve	4,939	0.5%	8,812	1.4%	5,479	0.6%
Total	1,021,127		785,349		619,660	

Table 7 Allocation of resources in 2022 by service type and funding scenario

Service Type	2022 Growing		2022 Stable		2022 Reduced	
	Plat Hrs	%	Plat Hrs	%	Plat Hrs	%
Frequent Express	213,324	25%	197,847	26%	197,847	31%
Frequent Rapid	88,332	10%	57,199	8%	57,199	9%
Frequent Local	115,197	14%	117,364	16%	120,855	19%
Infrequent Express	94,292	11%	94,292	13%	94,292	15%
Infreq. Local (Future Frequent)	44,472	5%	44,933	6%	16,531	3%
Infreq. Local (Coverage)	147,632	18%	120,456	16%	42,641	7%
Peak-only	140,202	17%	120,238	16%	115,954	18%
Contingency reserve	15,303		10,768		19,877	
Total	843,451		752,329		645,318	

Table 8 Allocation of resources in 2015 by service type and funding scenario

Service Type	2015 Growing		2015 Stable		2015 Reduced	
	Plat Hrs	%	Plat Hrs	%	Plat Hrs	%
Frequent Express	145,989	20%	145,989	20%	80,979	13%
Frequent Rapid	67,933	9%	67,933	9%	55,236	9%
Frequent Local	79,499	11%	79,499	11%	130,882	20%
Infreq. Express	92,430	12%	92,430	13%	92,430	14%
Infreq. Local (Future Frequent)	45,975	6%	45,975	6%	55,882	9%
Infreq. Local (Coverage)	138,167	19%	128,556	18%	88,737	14%
Peak Express	173,541	23%	173,541	24%	142,217	22%
Contingency reserve						
Total	743,535		733,924		646,362	

Draft

APPENDIX 5: MEASURES OF EFFECTIVENESS (MOEs)

Measures of effectiveness (MOEs) can be used to help identify and prioritize potential projects that advance the "Abundant Access" service vision and realize the 2030 Frequent Transit Network. MOEs are qualitative and quantitative metrics that provide information about the performance of individual projects and/or the progress in implementation of the Bellevue Transit Master Plan (TMP).

To achieve a comprehensive understanding of the extent to which a project or plan is successful, the measures of effectiveness used should relate to a variety of different qualities associated with transit operation and service that may be affected by the proposed projects. Further, although being considered in the context of a transit plan, it is important that the MOEs used consider the impacts to every mode of travel, as projects that benefit one mode often do so at the expense of others. MOEs should therefore consider four types of travel modes—transit, private vehicles, pedestrians, and bicyclists—and this plan additionally proposes the consideration of people generally, regardless of their mode of travel. MOEs can also describe outcomes geographically: at a specific intersection or location, along a corridor, or for mobility management areas (MMAs) or the city as a whole.

Existing Metrics

King County Metro uses a variety of metrics to track the performance of the routes that it operates. The following is a brief review of the metrics established in Metro's Service Guidelines, adopted in July 2011 in conjunction with the agency's Strategic Plan for Public Transportation 2011-2021. Metro's purpose in establishing these guidelines is to provide an all-day and peak-hour network that supports regional

growth plans, responds to existing ridership demand, provides productive and efficient service, ensures social equity, and provides geographic value through a network of connections between major urban and activity centers.

The performance measures established follow from these goals and are applied to different service types and at different scales as deemed appropriate. Thus, not every measure is considered for every route or at every scale; for example, some measures are considered only for corridors that serve all-day needs, while peak-only services are assessed using different measures. The Guidelines establish three distinct analytical processes for assessing route performance: the first addresses route productivity by considering the measures rides per platform hour and passenger miles per platform mile, the second addresses service quality by examining passenger loads and schedule reliability, and the third assesses the level of service provided by individual routes according to the type of service they provide—all-day or peak-only.

The analysis process for all-day routes follows three distinct steps to determine the appropriate level of service for each route. The process begins by examining three performance categories—land use, social equity, and geographic value—and their respective performance measures, including household and job density, the percentage of a corridor's population that is classified as low-income or minority, and whether the corridor provides the primary connection between designated centers. Points are awarded based on an established scale, with the total providing the initial suggested level of service for peak, off-peak, and night-time hours. The second stage of the assessment examines the load, cost recovery, and demand for late-night service at

Figure 120 The King County Metro *Strategic Plan for Public Transportation 2011-2021*.

Draft

Table 9 Metro guidelines for service adjustment.

Guideline	Measures
Productivity	Rides per platform hour Passenger miles per platform mile
Passenger Loads	Load factor
Schedule Reliability	On-time performance Headway adherence Lateness
All-Day and Peak Networks	Current service relative to All-Day and Peak Networks

King County Metro uses the above guidelines when adding or reducing service and in the ongoing development and management of transit service.

the suggested level of service. Adjustments to the initial suggested levels of service are assigned based on the figures obtained in this step, thereby providing the final suggested service levels. The existing and final levels of service are then compared to determine whether corridors are currently over- or under-served.

Metro's service level assessment process is corridor-based, not route-based, so only those corridors categorized as serving an all-day need are assessed in the way described above. Peak-only routes, which comprise more than half of the routes currently operating in Bellevue, are assessed by only two measures: whether they are at least 20 percent faster and if they serve at least 90 percent as much ridership compared with their all-day alternatives.

The *Transit Network Profile Report* published in April 2012 as part of the TMP Service Element presents these metrics for all Bellevue-serving routes. While Bellevue will continue to monitor Metro's assessment of these measures, it should be noted that these measures relate exclusively to the allocation of transit service.

PROPOSED MEASURES

Draft

The Transportation Commission prepared the following four measures of effectiveness (MOE) on October 17, 2013 for monitoring progress in achieving Bellevue's transit service vision:

1. Measure service availability on Bellevue's Frequent Transit Network corridors.
2. Measure transit usage in Bellevue's Mobility Management Areas.
3. Measure person throughput by mode on Bellevue's Frequent Transit Network corridors.
4. Measure travel time savings resulting from speed and reliability improvements on Bellevue's Frequent Transit Network corridors.

By providing a sense of the quality of transit service in Bellevue, these metrics can serve as a tool for communicating the City's need for transit service delivery and capital improvements to the public, King County Metro, Sound Transit, and other elected leaders. These measures can be organized into the following performance categories:

- **Service Availability:** ease of use for various kinds of transit trips;
- **Transit Usage:** passenger satisfaction with the quality of transit service provided;
- **Person Throughput:** transit's role in managing roadway capacity and operations; and,
- **Travel Time:** how long it takes to make a trip by transit in comparison with another mode.

With the exception of the transit usage MOE, which will be reported twice annually, the other metrics will be produced on a five-year reporting cycle. In the intervening years, Bellevue staff will monitor King County Metro's Strategic Plan and Service Guidelines, which established a system of operations performance standards and network evaluation based on measures of productivity, social equity, and geographic value.

Draft

Service Availability

The first MOE—"measure service availability on Bellevue's Frequent Transit Network corridors"—will help the Transportation Department determine whether transit service is a viable option for a given trip in Bellevue. Where, how often, and when transit service is provided are all important factors in one's decision to use transit. In transit planning terms, these qualities are known as accessibility (or service coverage), service frequency, and service span, respectively. From the user's perspective, service frequency determines how many times per hour a user has access to transit at a given location, assuming that location is within an acceptable walking distance (measured by service coverage) and service is provided at the times the user wishes to travel (measured by service span). The following spatial and temporal attributes—when considered together—provide an assessment of transit service availability.

Route Frequency

Transit frequency is the number of transit vehicles scheduled to serve a given stop during one hour. Frequency was reported as the top factor influencing overall trip satisfaction in the Bellevue Transit Improvement Survey. The more frequent the transit service, the shorter the wait time when a bus is missed or when the exact schedule is not known before arriving at a bus stop, and the greater the flexibility that customers have in selecting travel times. The longer the service headway (the time between successive buses), the more inconvenient transit becomes, both because passengers have to plan their trip around bus schedules and because they incur more unproductive time during their trip.

Research suggests that 30-minute service frequency is considered to be unattractive to discretionary riders—those with access to an automobile who choose to use transit—while

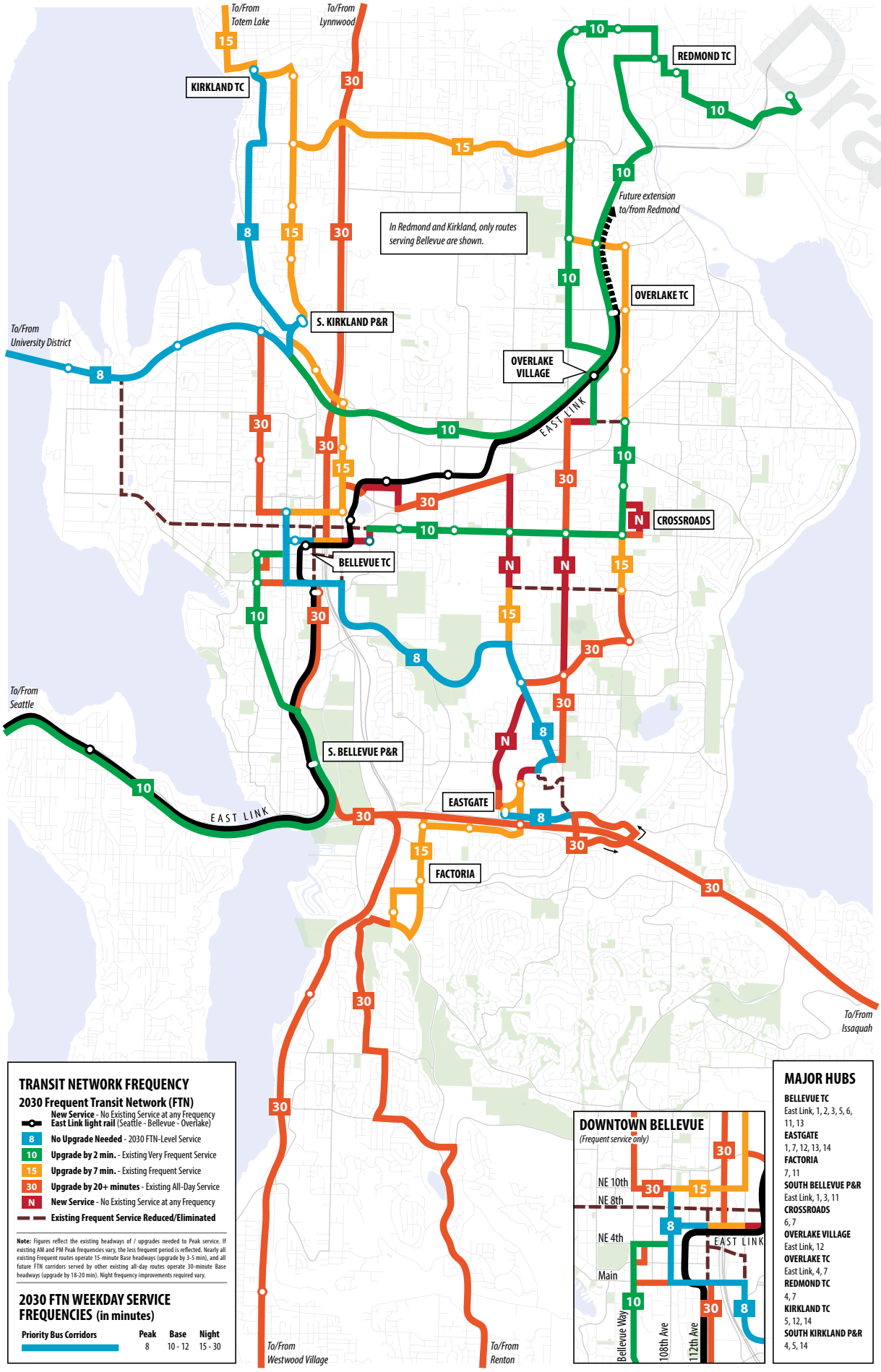
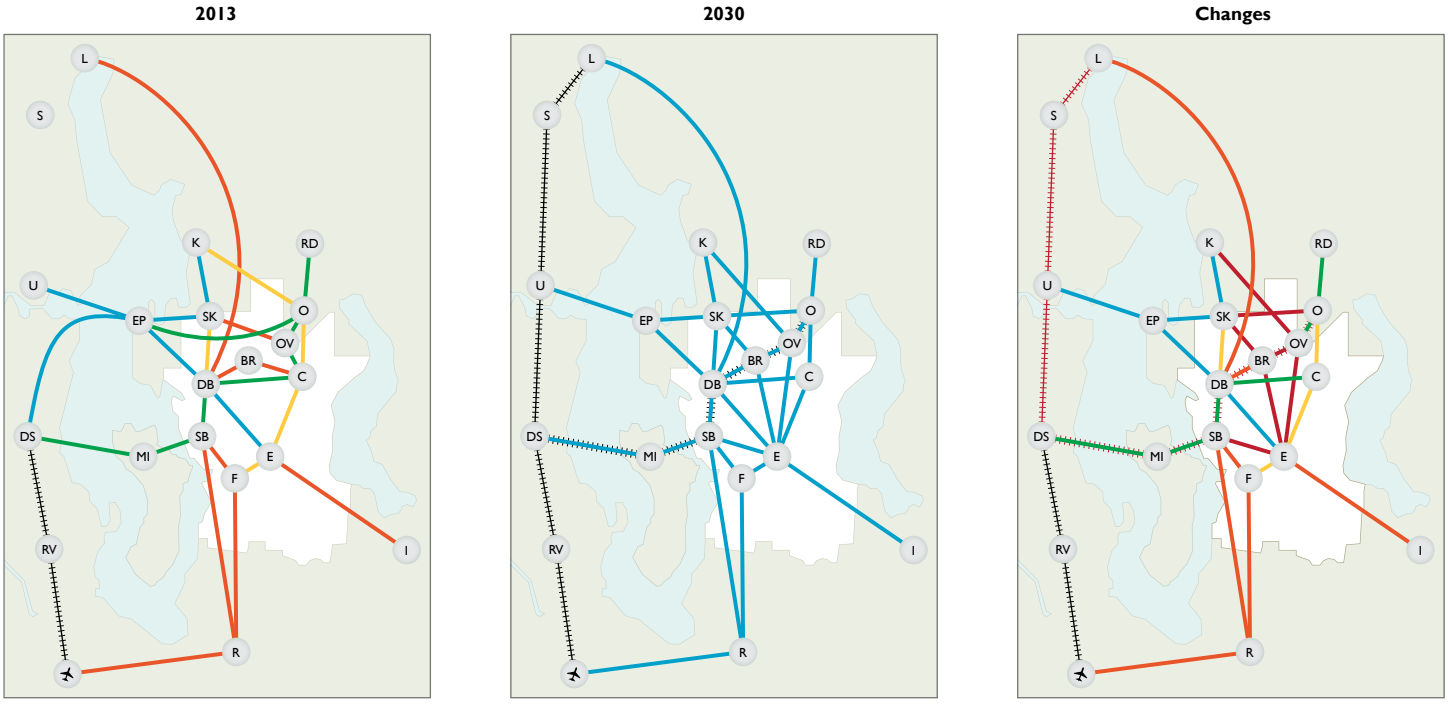


Figure 121 Headway upgrades required from 2013 network to achieve the 2030 Frequent Transit Network.

15-minute service in the peak periods is considered a significant threshold to making transit a competitive alternative to driving. This threshold mainly relates to the amount of time people are willing to wait if they just miss a bus. With a 30-minute wait until the next bus, most people with a car available will not risk having to wait that long and will thus not attempt to take the bus at all.

Assessing route frequency involves determining whether each portion of the FTN achieves the headway thresholds for frequent service defined in the *Transit Service Vision Report*. Staff will develop a table and map reflecting the percentage of FTN corridor segments operating at these target headways. Figure 121 reflects the route segments along 2030 FTN corridors and the upgrades in service headways required to achieve 2030 target frequencies. *Route segment* refers to a portion of an FTN route that is bounded by an intersection with another route on both sides. This method avoids consideration of the transit network in terms of the block-by-block approach promoted by the *Highway Capacity Manual*. Figure 122 reflects the connections between major local and regional centers served by FTN routes and indicates which require upgrades to achieve 2030 FTN-level service. Both figures depict only those segments and connections operated by FTN routes—infrequent all-day services are not shown.

Figure 122 Progress toward 2030 FTN by frequency of service connections between major centers.



Legend

BELLEVUE

- **BR** Bel-Red
- **C** Crossroads
- **DB** Downtown Bellevue
- **E** Eastgate
- **F** Factoria
- **SB** S. Bellevue Park & Ride

REGION

- **DS** Downtown Seattle
- **EP** Evergreen Point
- **I** Issaquah Transit Center
- **K** Kirkland Transit Center
- **L** Lynnwood
- **MI** Mercer Island
- **O** Overlake Transit Center
- **OV** Overlake Village
- **R** Renton
- **RD** Redmond Transit Center
- **RV** Rainier Valley
- **S** Shoreline
- **SK** S. Kirkland Park & Ride
- **U** University District
- SeaTac

	Peak	Midday	Night
Very Frequent (every train connection)	≤8	≤12	15-30
Infrequent	30	15-30	30-60
LRT			

Note: numbers reflect approximate peak/midday/night frequencies.

2013 - 2030 FTN Upgrades Required

- 8 **No Upgrade Needed** - 2030 FTN-Level Service
- 10 **Upgrade by 2 min.** - Existing Very Frequent Service
- 15 **Upgrade by 7 min.** - Existing Frequent Service
- 30 **Upgrade by 20+ minutes** - Existing All-Day Service
- N **New Service** - No Existing Service at any Frequency
- **Existing Frequent Service Reduced/Eliminated**

Draft

Route Coverage

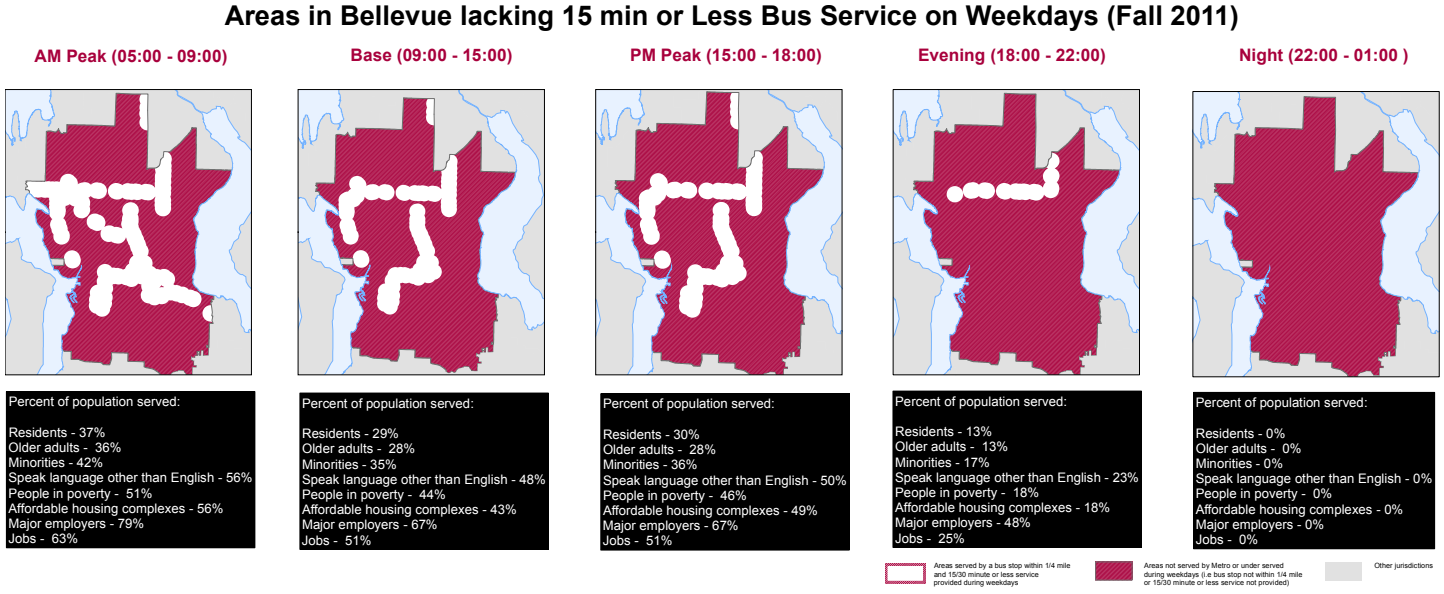
The presence or absence of transit service near one's origin and destination is a key factor in one's choice to use transit. Route coverage is a measure of the area within a reasonable walking distance of transit service. When combined with service frequency and span data, route coverage helps identify the number of opportunities people have to access transit from different locations.

The calculation of the transit route coverage area is performed through the use of a geographic information system (GIS) using the following data: (i) bus stop locations from King County Metro's GIS database, and (ii) demographic data (population and jobs) from the U.S. Census Bureau. Bellevue's GIS software buffering feature is then used to outline on a map all of the area within one-quarter mile of an FTN bus stop. The one-quarter mile buffer is consistent with industry literature that most passengers (75 to 80% on average) walk one-quarter mile or less to bus stops. At an average walking speed of 3 mph, this is equivalent to a maximum walking time of 5 minutes.

In conducting this analysis, Transportation Department staff will assess how many Bellevue residents and employees are provided frequent bus service by day of week (weekday and weekend) and time of day (AM peak, base, PM peak, evening, and night). Broadening the route coverage analysis to consider service span helps to refine this assessment of service availability to potential users. If transit service is not provided at the time of day a potential passenger needs to take a trip, it does not matter where (coverage) or how often (frequency) transit service is provided to the rest of the day. Some potential transit riders choose not to use transit services because particular services are unavailable for their anticipated return trips or because they cannot be certain about the time of their return trips and need to be certain that they do not get stranded. Figure 123 reflect areas in Bellevue lacking 15-minute bus service on weekdays and weekends, respectively, based on Fall 2011 data.

Draft

Figure 123 Weekday level of service coverage, Fall 2011.



Draft

Transit Usage

The second MOE—"measure transit usage in Bellevue's Mobility Management Areas"—will help the Transportation Department track passenger satisfaction with the quality of transit service provided in Bellevue. The transit usage calculation is performed with a geographic information system (GIS) using the following data: (i) average weekday stop-level usage data (ons/offs) on bus routes operating in Bellevue, and (ii) Bellevue's GIS shapefile of the 14 Mobility Management Areas (MMA) of the city. Tracking transit usage occurs twice annually, reflecting average weekday stop-level on/off data from the Spring and Fall service changes.

Figure 7 reflects daily transit usage by Bellevue MMA for Fall 2004, 2006, 2008, 2010, and 2012. Increased usage of transit is correlated to the numerous service and capital investments that have been made over this period to improve travel options in Bellevue. Public transportation ridership in Bellevue has grown steadily since the adoption of the 2003 Transit Plan; average weekday transit ridership in Bellevue rose from 25,300 (in 2004) to 50,300 (in 2012)—a 99 percent increase.

Person Throughput

The third MOE—"measure person throughput by mode on Bellevue's Frequent Transit Network corridors"—will assist the Transportation Department in tracking transit's contributions to improved mobility on Bellevue's street network. Historically, arterial street performance has been based mostly on outcomes for vehicles rather than people. In classical highway engineering, the goal is maximizing "vehicle throughput", expressed by letter grades that reflect an intersection's level of service (LOS). Vehicle throughput is based on the volume-to-capacity (V/C) ratio, which divides the total number of vehicles at a given intersection by the capacity of that intersection to handle cars. The V/C ratio regards each vehicle as equally important regardless of how many people it carries.

There is a growing recognition in the transportation industry that metrics that focus solely on vehicle throughput are unable to adequately capture the human and social costs of lost time and money. That is, vehicles do not lose time, but people do. In order to improve automobile LOS at a given intersection, for example, traffic engineers may inadvertently favor a reliance on vehicle-oriented solutions that unintentionally limit other investment choices. The result of these actions may be that the intersection can handle more vehicles but fewer people. In the long-term, as the city grows, managing the transportation system with an exclusive focus on auto congestion paradoxically results in more auto congestion than an approach that considers all modes.

The Transit Capacity and Quality of Service Manual Third Edition defines person capacity as: "The maximum number of people that can be carried past a given location during a given time period under specified operating conditions; without unreasonable delay, hazard, or restriction; and with reasonable certainty." Person throughput—a function of the mix of vehicles in the traffic stream, including the number and occupancy of each type of vehicle—recognizes

Draft

Draft

the difference between a single bus containing 40 people and a pair of cars that occupy the same space but contain only 2 people.

A commitment to measure person throughput is found at every level of government in Washington State. Because transportation impacts do not stop at local boundaries, coordination between jurisdictions is important—indeed, it is recognized by Bellevue's *Comprehensive Plan* as being "absolutely necessary". It is therefore instructive to consider how state and regional entities address the subject of person throughput.

Bellevue's person throughput calculation is performed with the Bellevue-Kirkland-Redmond (BKR) travel demand model. Inputs to the four-step model used in travel demand forecasting are current land use, the current transportation system, forecast changes in households, employment, and transportation system improvements, and the

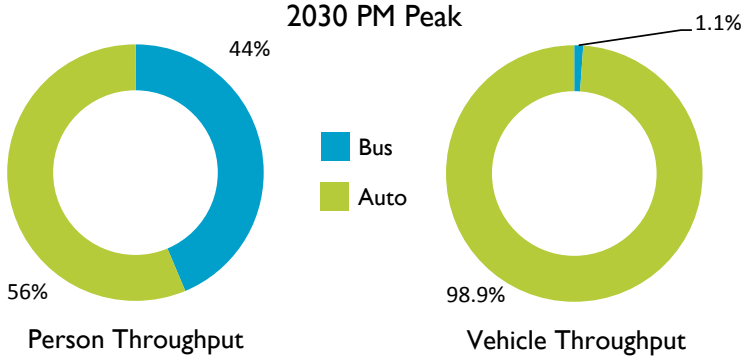
Figure 124 2030 PM peak projected travel demand along Bellevue Way SE between SE 8th St and 113th Ave SE.

Bellevue Way SE

SE 8th St to 113th Ave SE

Buses[1]	36
Total Vehicles[1]	3,230
Percent Transit[1]	1.1%
Person Trips – Transit[1]	3,363
Person Trips – Total[1]	7,705
Percent Transit[1]	44%

Projected Travel Demand
2030 PM Peak



[1] Based on City of Bellevue 2030 PM Peak Hour BKR Model (MP30R6.2).

fraction of trips made during the peak period. The travel demand model compares demand for travel to the supply of the roadway system within the project area. Travel demand is derived from population and employment, while the supply side of the equation is the roadway system on which travel occurs.

The BKR model produces Peak-Period Person Throughput (PPPT) by mode for the corridor segments that comprise the Frequent Transit Network (FTN) defined in the *Transit Service Vision Report*. The PPPT metric takes into account average vehicle occupancy of personal vehicles and public transportation. By measuring performance during peak periods, PPPT focuses attention on the time period when the transportation system is most stressed. The public easily understands peak-period performance, as it impacts many travelers through the daily commute, and improvements to system performance during peak periods are visible and appreciated.

As reflected in Figure 124, BKR model data facilitates a comparison of PPPT values for both transit and personal vehicles along FTN corridor segments. In the case of Bellevue Way SE between SE 8th Street and 113th Avenue SE, the 2030 projected PPPT on transit is 44 percent of all person trips. When considered from a vehicle throughput perspective, transit represents only 1.1 percent of all vehicle trips along this FTN corridor segment. Clearly, bus service is projected to make efficient use of the roadway capacity in this corridor.

Although the example provided is for projected 2030 conditions, BKR travel demand model outputs can also be generated for current conditions. Bellevue is able to aggregate prior year annual bus ridership data for each of the FTN corridors. This data is then compared to auto volume and person trips found in the base year model.

Draft

Draft

Travel Time

The fourth MOE—"measure travel time savings resulting from speed and reliability improvements on Bellevue's Frequent Transit Network corridors"—will assist the Transportation Department in tracking the improvements realized by transit priority investments and help identify FTN service connections where ridership gains and operating cost savings might be realized from proposed transit priority measures. The Transit Capacity and Quality of Service Manual Third Edition notes that travel time is a useful metric for assessing transit performance because "travel time directly impacts the number of transit vehicles needed to operate on a route at a given headway and the impact of location-specific transit preferential treatments and operational strategies will typically be expressed as a travel time saved per location," and also because "ridership elasticity factors... exist for average speed, allowing the impact of speed improvements on ridership to be estimated."

According to respondents of the *Bellevue Transit Improvement Survey*, improving bus speed and reliability by investing in roadway and traffic signal infrastructure is the highest priority for municipal investment in transit. Attracting ridership is of course important to transit operators, but speed also impacts the cost of operating a route. The number of transit vehicles required to operate a service at a given frequency depends on the route's cycle time (the time required to make a round-trip on the route), plus driver layover time, and any additional schedule recovery time required beyond layover time. The cycle time (in minutes) divided by the headway (in minutes per vehicle) gives the required number of vehicles to serve the route. If a route's cycle time can be reduced sufficiently to reduce the required number of vehicles, cost savings result. Alternatively, the saved vehicle can be used to increase frequency on this or another route with no net change in operating costs.

Bellevue's travel time MOE is considered in terms

of two metrics: one assesses operating speeds in absolute terms and compares observed speeds to service vision targets, and the other expresses transit travel time in relative terms compared to automobile travel time. Together, these two measures provide a comprehensive understanding of the degree of mobility offered by transit service as it relates both to operations and users. The first metric calculates the average operating speed of all routes comprising each FTN service type—Frequent Express (FX), Frequent Rapid (FR), and Frequent Local (FL)—for each period of the day. These values are then compared to the target operating speeds established in the *Transit Service Vision Report* for 2022 and 2030. Congestion on local roads is projected to worsen as time progresses, hence the estimated operating speeds for FR and FL services are expected to decline between 2022 and 2030. By contrast, the average speeds of Express services increase by 2030 because Route 550—currently the slowest of the Express services—will be discontinued after it is replaced by East Link light rail. Although the general trend is toward declining speeds over time, observed operating speeds in 2012 are not uniformly faster than the estimated speeds for future years. For example, Rapid service is estimated to be 10% faster than Local service in future years per guidance received from Metro, but Bellevue's only existing Rapid route (B Line) does not presently achieve such a speed premium over the average of all local all-day services. If observed speeds in 2022 and 2030 are ultimately found to be slower than the estimated targets, this may have implications for the amount of transit service operated in Bellevue.

Stated simply: time is money. Slower service means less service unless Bellevue can secure additional resources (in terms of annual platform hours operated within the city) from local transit agencies. This is because slower operating speeds result in longer

Draft

Draft

cycle times, which if sufficiently longer than planned will require additional vehicles to provide the same level of service. If additional resources cannot be secured to offset the difference, service frequency or span may need to be reduced to remain within the annual platform hour budget. The importance of achieving the targeted operating speeds therefore cannot be overstated, as these estimates play a central role in determining how much service can be operated given a particular budget.

The second measure assessing travel time is a ratio obtained by dividing transit travel time by auto travel time. A Transit/Auto (T/A) ratio greater than 1.0 reflects transit travel times that exceed auto travel times. As a general rule of thumb, T/A ratios of 2.0 or above are considered not competitive to trips by auto and are therefore less likely to attract ridership. Figure 9 reflects PM peak transit travel times, auto times, and T/A ratios from Downtown Bellevue to various local and regional destinations. Additional details about this methodology—derived from manually tabulating travel times using Google Maps—are reflected in the Bellevue Transit/Auto Travel Time Analysis Report, in which transit travel times were compared to the time it would take to reach the same destination at the same time of day by car.

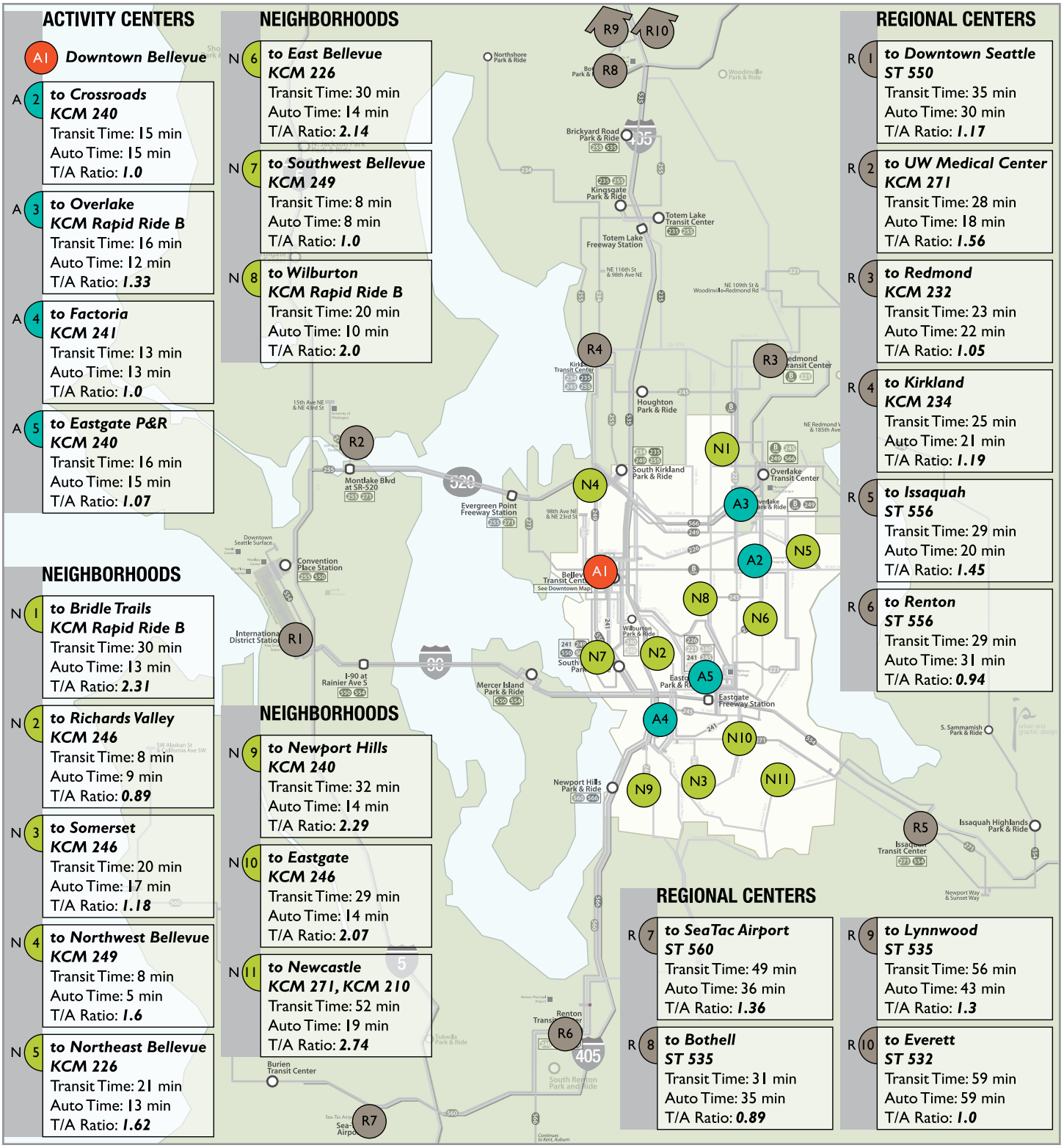
Travel times used to calculate the T/A ratio on Bellevue's FTN corridors can be obtained from a variety of sources, including:

- Field data, from auto travel time runs and transit automatic vehicle location (AVL) data;
- Estimates of auto and transit speeds from the Highway Capacity Manual or simulation;
- Online mapping tools like Google Maps, that can provide estimates of auto and transit travel times, including the effects of recurring traffic congestion; or
- BKR travel demand model, for origin-destination trips.

Whichever source is selected, it should be used as the basis for both transit and auto travel times. When travel times are estimated, rather than measured directly, a sample of estimates should be compared against existing conditions to verify the reasonableness of the estimates and, if necessary, develop correction factors for them.

Draft

Figure 125 Weekday level of service coverage, Fall 2011.



ACKNOWLEDGEMENTS

Without the support of the citizens of Bellevue, completion of this plan would not have been possible. The City would like to specifically thank the following groups and individuals for their contributions and cooperation in preparing the Bellevue Transit Master Plan.

Bellevue City Council

Claudia Balducci, Mayor
Kevin Wallace, Deputy Mayor
John Chelminiak
Conrad Lee
Jennifer Robertson
Lynn Robinson
John Stokes

Transportation Commission

Ernesto Simas, Chair
Scott Lampe, Vice-Chair
Vic Bishop
Tom Tanaka
David Jokinen
Francois Larrivee
Janice Zahn

Thanks to all other boards and commissions members involved in the Transit Master Plan.

Arts Commission: Genevieve Tremblay, Kris Liljeblad
Human Services Commission: Jim McEachran
Parks & Community Services Board: Dallas Evans, Stuart Heath
Planning Commission: Aaron Liang, Jay Hamlin, Pat Sheffels

Transit Master Plan Core Staff

Franz Loewenherz, Project Manager
Andreas Piller, Project Coordination & Graphics

City Support Staff

Dave Berg, Paula Stevens, Kevin McDonald, Judith Clark, Hu Dong, Sean Wellander, Mark Poch, Raid Tirhi, Kurt Latt, Mike Whiteaker, Fred Liang, Kim Becklund, Stela Nikolova, Emil King, Gwen Rousseau, Midge Tarvid, Ruchi Bhutani, Neil Shetty, Zorba Conlen

Volunteers

Michelle Whitfield
Kathlyn Kinney
Jessie Huang
Jessie Huang
Thao Phung
Ana Rivero
Natalia Shishkina
Areeba Soomro
Daniel Warwick

PHOTO BY Guy de Gouville

The City of Bellevue would also like to thank the following people for their contributions to the Transit Master Plan over the course of the past two years:

Project Consultants

Jarrett Walker + Associates
Jarrett Walker, Sherwin Lee

Transpo Group
Jon Pascal, Mike Swenson, Adam Parast

Graphics Support
Jessica Stein (JS Urban & Graphic Design), Renata Homolya,
John Tiscornia (John Tiscornia Photography)

King County Metro
David Hull, Christina O'Claire, Stephen Hunt, Ruth Kinchen, Katie Chalmers,
Jack Whisner, Owen Kehoe

Sound Transit
Jim Moore, Benjamin Smith, Michael Couvrette, Mike Bergman, Eliot Mueting

Puget Sound Regional Council
Alex Krieg, Michael Jensen

Other Stakeholders and Regional Partners

Chester Knapp, City of Redmond
David Godfrey, City of Kirkland
Jon Morrison Winters, Hopelink
Mark Hazen, Bellevue School District
Steve Kasner, East Bellevue Comm. Council
David Gruen, Bellevue College
Jim Stanton, Microsoft
Lincoln Vander Veen, Bellevue Chamber of Comm.
Paulo Nunes-Uneo, Seattle Children's Hospital
Thang Nguyen, City of Kirkland